A Cross in this space is a reminder that your Subscription to the Journal expires with this number.

ANNUAL RATES OF SUBSCRIPTION.
Farmers, Graziers, Horticulturists, and Schools of Art FREE on prepayment of 1/- to cover postage. Members of Agricultural Societies, 5/-, including postage. General Public, 10/-, including postage.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. XX. SEPTEMBER, 1923. PART 3.

Event and Comment.

The Current Issue.

An account of the great Annual Show of the Royal National Association fitly occupies much space in this issue. The activities of the Department of Agriculture and Stock, as illustrated at the Exhibition, are well described in text and picture. Other Show features include a full list of awards in the more important classes. A further instalment of an informative series on irrigation in Queensland, bearing particularly on the use of artesian water in the West, will be read with much interest. The Clydesdale stallions recently purchased by the Government for use in improving the breeding of farm horses are fully described. Valuable contributions on the technical side from the Seeds, Fertilisers, and Stock Foods Section and the Bureau of Sugar Experiment Stations are among other special features. Seasonal contributions include an illustrated treatise on the cultivation of cotton in Queensland, which is also on issue to cotton-growers in bulletin form. The September Journal, generally, is a good number.

Queensland's Opportunity.

A full report by a well-known dairy expert on our butter states that there is very keen activity in the British butter market, and that Queensland as a competitor has an excellent opportunity to more than justify her claim as a first-rate butter and cheese producer. Last season Queensland contributed some excellent butter, but the percentage of "choicest" leaves something to be desired. It appears that one of the principal faults is that the "choice" flavour is weak or insipid, and the salt butter lacks briskness. He insists on the necessity for factories to carefully adopt practices which aid in the development of the choice butter flavour in cream, and to fix it in the butter. With this constantly in mind, and aided by strict grading of the cream and butter, he considers that Queensland can advance her position in the British market for flavour of butter second to none in the world. "Fishiness" in our butter has greatly diminished of late, and this fact is attributed to the more careful grading of the cream, to reducing the acidity for churning, and to lower temperature. "Choice" and "first-grade" Queensland butter, although highly creditable in many respects, has shown traces of heat in the flavour and texture, and has consequently suffered in price. In colour, finish, and packing, it is stated that there is little room for improvement in connection with Queensland butter.

The Queensland Climate—Snow in August.

Queensland by many people outside its borders is looked upon as a land of perpetual summer, but a glimpse of the Downs mantled in glistening white during early August would quickly dispel that illusion. As a matter of fact, as travelled Queenslanders know, this State possesses one of the finest and healthiest climates in the world. On the northern tablelands, as in other districts, heavy frosts were experienced in the course of the winter, and snow fell over a wide area on the southern uplands.

Oversea Marketing of Queensland Products.

The annual report of the Agent-General (Hon. J. A. Fihelly) contains much valuable information on our oversea marketing operations in primary products. Reference is made in the report to the depression in the Queensland meat export trade. Changes in values, from artificial to comparatively stable levels; changes in consumptive demand, from one class of meat to another; and changes in volume, character, and direction of supplies had seriously affected operations. If it is any consolation to those interested in the industry, it may be safely assumed that the worst of the crisis has passed, and the market must improve. Any substantial improvement, the report continues, can only be achieved by the adoption of a settled policy and thorough organisation. The economic embarrassment of Europe is the cause of many of the present difficulties, and until there is some assurance of stability Australia's market must necessarily be curtailed. It must be remembered, too, that each year witnesses a progressive recovery in the numbers and quality of Continental herds and flocks, which in turn means a lessened demand for extraneous supply. Queensland must relax no effort to regain the market, and to this end increasing attention should be paid to the question of a general raising of standard and quality; to an improvement in transport facilities; to correcting the widespread laxity in grading; and to an improvement in loading arrangements. Increased skill in slaughtering and dressing are also considerations upon which the technical people in London lay stress.

The London Butter Market.

According to the report butter on the London market is rapidly regaining its pre-war volume, as a considerable expansion in imports show, and this expansion is being maintained despite the disappearance of several sources of supply. The greatly increased output from Queensland has compensated somewhat for these deficiencies. In fact, the quantity of butter received in London from Empire sources now exceeds that imported from foreign countries, whereas before the war the percentage was 20 Empire to 80 foreign.

Price fluctuations have been quite abnormal. Every time the market rose it rose too high, and every time it fell it fell too low, a considerable element of luck characterising selling results. The average selling price was lower than in any year since 1916. Some complaints were received of one or two of the earlier shipments that they were not quite up to the usual standard, but the quality soon improved, and is now very good, our best quality being admittedly quite the equal of Danish or Irish.

A decided improvement was noticeable during the season in the class of boxes used by the various factories, and it is hoped that the better standard in this respect will continue. In the competition with supplies from other sources, it is distinctly desirable for goods to be landed in London in sound and attractive looking packages at which the most critical would not be able to cavil. The different type of box adopted by Victoria and South Australia proved popular among those who have to handle supplies on the other side, because it affords an easier grip on the box. The wood is thinner than usual, but is strengthened by a sort of outer frame which can be readily gripped. There is, however, no serious fault to be found with the type of box used by Queensland exporters.

At the Annual London Dairy Show the following awards were made for salted varieties:—

First prize—100 points, Logan and Albert Co-operative Company.
Second prize—99½ points, Maryborough Co-operative Company.
Third prize—99 points, Goombungee Co-operative Company.

For unsalted butter the Logan and Albert Company also secured a third prize. In addition to these awards the exhibits of the Mundubbera and Biggenden factories in the salted class were each highly commended, both gaining 97 points. The only other exhibit securing this distinction was the Coraki Co-operative Company of New South Wales. The results reflect great credit on the Queensland dairying industry.

Southern Interest in Queensland Farmers' Organisation.

Agriculturists in other States are giving some attention to the Queensland farmers' move towards complete organisation. In Southern Press reports reference is made frequently to the efforts of Queensland producers in practical co-operation. At a meeting of the State Fruit Advisory Board of Victoria in Melbourne recently ("Age," 22nd August, 1923) methods of marketing were discussed. One speaker (Mr. Wade) emphasised the necessity of educating growers in modern practices, and instanced the progress of Queensland orchardists towards the general adoption of a sound selling system. Queensland, he continued, had moved in the right direction in insisting that trans-border fruit consignments must be of a certain standard. Sir John Taverner, at the same meeting, also emphasised the need of organisation, and expressed the opinion that the Board should seriously consider the Queensland scheme and bring forward a report on the marketing of fruit. The Board decided to convene a special meeting to consider the Queensland fruit marketing proposals adopted by the recent orchardists' conference in Brisbane.

CLYDESDALE SIRES FOR QUEENSLAND.

GOVERNMENT PURCHASE OF PEDIGREED HORSES.

With the object of assisting practically in the breeding of draught stock in Queensland, the Department of Agriculture and Stock lately purchased six Clydesdale stallions in the South for service in the farming districts of the State. The description, pedigree, and prize-winnings of each horse are given below.

FABRIC'S HEIR.

Fabric's Heir (Mitchell and O'Briens, imp. from New Zealand), brown colt, foaled 1917.

Sire.—Dunure Fabric (16,864, C.S.B., imp.); grandsire, Dunure Footprint (15,203, C.S.B.). Gained in 1912, 1913, and 1914 the central district of Aberdeenshire premium; in 1915 he was the central district of Ayrshire stud horse; in 1916

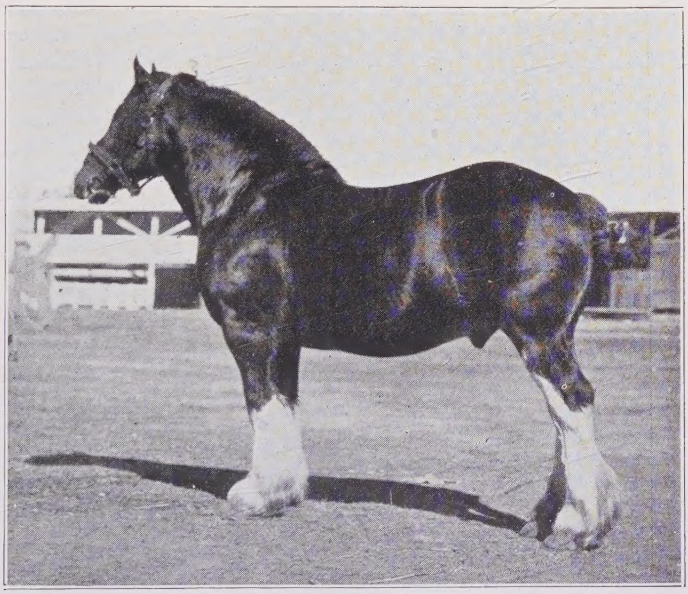


PLATE 29.—"FABRIC'S HEIR."

he was the Ayr district of Ayrshire stud horse; in 1917 he was the county district of Ayrshire stud horse. The "Australasian" of 31st May, 1919, states that Dunure Footprint was standing that season at a service fee of £100 a mare; G. grandsire, Baron of Buchlyvie (11,263 C.S.B.) was sold by auction in Scotland for £9,500. He gained in 1905 and 1907 the Strathmore district of Forfarshire premium; in 1906 the Girvan district of Ayrshire premium; in 1908 the central district of Ayrshire premium; G.g. grandsire, Baron's Pride (9,122 C.S.B.) was awarded numerous local prizes as a youngster, and in 1894, when four years old, was first and champion male Clydesdale exhibited at the Highland and Agricultural Society's show, Aberdeen; he also gained first prize at Glasgow show. In 1894 and 1895 he won the Kirkcudbright District Society's premium; in 1896 he gained the Machars of Wigton premium; and in 1897, 1898, and 1899 he was again hired by the Kirkcudbright district.

Fabric's Heir's dam, Lady McGregor, by Premier Pride (11,845, C.S.B., imp.), who won, as a two-year old, first prize at the Royal Show, London, and first prize at Castle Douglas. In New Zealand he gained first and champion prizes at Ashburton

in 1907; second dam, Flora McGregor (504, N.Z.C.S.B.), by Highland Prince (618, N.Z.C.S.B.) (C), by Crown Prince (712, A.D.H.S.B.) (C), by Lord Dalisbury (1,205, C.S.B., imp.); third dam, Gipsy Queen, by Vanquisher (1,063, A.D.H.S.B.) (C), by Young Vanquisher (imp.) (967, A.D.H.S.B.) (C); fourth dam, Lass o' Gowrie, by Prince Royal (372, N.Z.C.S.B.) (C), by Craiglevar (imp.) (1,045, A.D.H.S.B.) (C); fifth dam, Bess II., by Prince Charlie (626, C.S.B., imp.); sixth dam, Bess, by Napoleon (556, C.S.B., imp.); seventh dam, Black Bess, by Black Prince (60, C.S.B., imp.); eighth dam, Miss Todd, by Canterbury; ninth dam, imported to New Zealand from Victoria.

Fabric's Heir won, in 1918, first prizes at Ashburton and Timaru shows; in 1919 second prize at Ashburton parade; and in 1920 first prize and reserve for champion at Timaru and second prize at Ashburton.

GENERAL WALLACE.

General Wallace.—(1,134, N.Z.C.S.B., Mitchell and O'Briens, imp. from N.Z.) bay colt, foaled 14th November, 1918; bred by Mr. W. Kennedy, Otarau, N.Z.

Sire.—General Douglas (16,412, C.S.B., imp.); grandsire, Douglas Chief (11,682, C.S.B.); G. grandsire, Prince Thomas (10,262, C.S.B.), won first and champion prizes at the Highland Society's show, Stirling; G.g. grandsire, Sir Thomas (9,681, C.S.B.); G.g.g. grandsire, Castlereagh (10,324, C.S.B.); G.g.g.g. grandsire, the

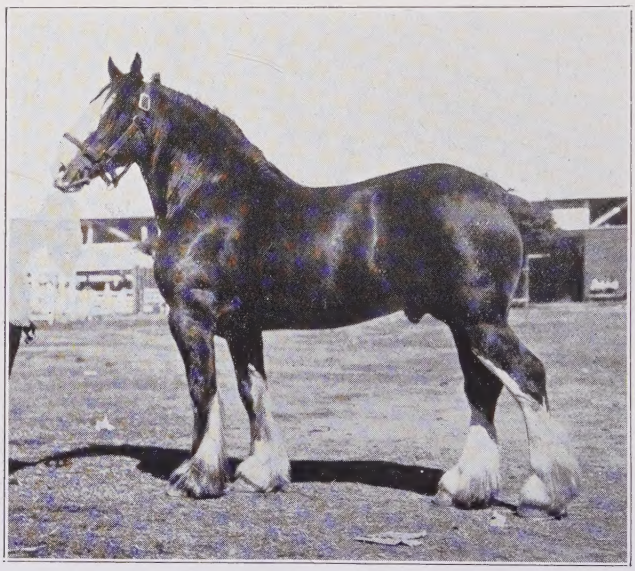


PLATE 30.—"GENERAL WALLACE."

famous Darnley (222, C.S.B.), won second prize at the Highland Society's show, Stirling, in 1873; the Glasgow premiums in 1876 and 1877; first prize at the Highland Society's show, Edinburgh, in 1877; the champion cup at the Highland Society's show, Dumfries, in 1878; second prize at the Royal Show of England at Kilburn in 1879; first prize at the Royal Show of England at Carlisle in 1880; first prize at the Highland and Agricultural Society's show at Glasgow in 1882, as sire of the best family of five aged animals exhibited; and first prize and champion cup at the Highland and Agricultural Society's show at Edinburgh in 1884.

General Wallace's dam, Studleigh Queen (1,034, N.Z.C.S.B.), by Abbot (11,987, S.C.B., imp.), who was the best two-year-old at the Royal Northern and was placed first at the Highland Society's show, Dumfries. In New Zealand he gained in 1905 first and champion prizes at Tapanui; in 1909 he gained first prize and reserve champion at the Southland metropolitan stallion parade; he has also gained two first prizes for stallion with progeny. Second dam, Dolly, by Carmyle (1,066, (A.D.H.S.B.) (C), who won first and champion prizes at St. Arnaud, Birchin, Shepparton, Tatura, Murchison, and Nathalia, and first prizes at Donald and Wycheproof, and second prize at the Royal show, Melbourne. In New Zealand he

won first prize in 1903 at Invercargill, and was got by Kelvin (456, A.D.H.S.B.) (C), who won seventeen first prizes, by Lord Clyde (478, C.S.B., imp.). Third dam, Mary Macarthur, by Macarthur (818, A.D.H.S.B.) (C), who won thirty-two first, two second, and one third prizes, and was got by Macbride (2,987, C.S.B., imp.). Fourth dam, Lily McCormick, by famous Lord Salisbury (1,205, C.S.B., imp.).

BARON AGAIN.

Baron Again (14, C.C.S.B.), bay roan horse, foaled 1917, bred by Gillis and Walter, Glen Lass stud farm, Werribee, Victoria.

Sire.—Baron Carlisle (218, A.C.S.B.), won 1914 first and champion prizes at Wagga, N.S.W., first and champion prizes at Wangaratta, first prize at Werribee, and first prize in his class and first prize for best actioned horse at Geelong; in 1915 he won first and champion prizes at Wagga, N.S.W. (beating the Melbourne Royal champion horse Captain Dale), and first and champion prizes at Wangaratta and Werribee; in 1916 he gained second prize and reserve for champion at Royal show, Melbourne; and in 1917 third prize at Royal show, Melbourne. Grandsire, Baron Belmont (13,973, C.S.B., imp.), won in 1909 the Bathgate district of West Lothian premiums, and in 1910 the Kelsyth and Kirkintillock district of Dumbartonshire

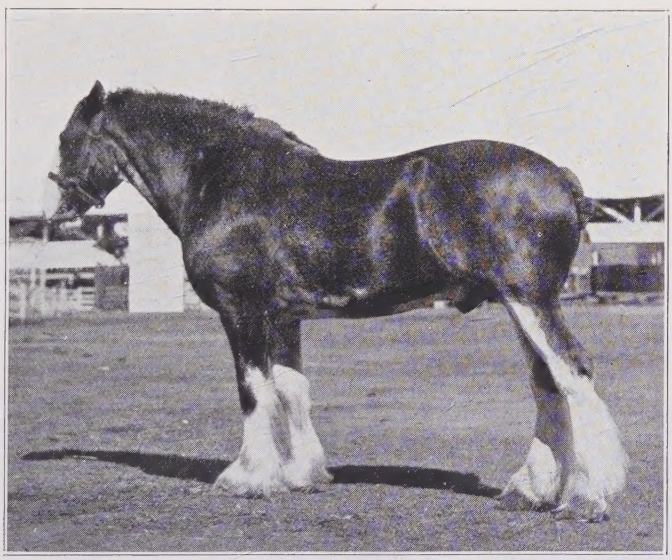


PLATE 31.—"BARON AGAIN."

premium. G.g. sire, Baron of Buchlyvie (11,263, C.S.B.), was sold by auction in Scotland for £9,500. He gained in 1905 and 1907 the Strathmore district of Forfarshire premiums, in 1906 the Girvan district of Ayrshire premiums, in 1908 the central district of Ayrshire premium. G.g. grandsire, Baron's Pride (9,122, C.S.B.) was awarded numerous local prizes as a youngster, and in 1894, when four years old, was first and champion male Clydesdale exhibited at the Highland and Agricultural Society's show, Aberdeen; he also gained first prize at Glasgow show. In 1894 and 1895 he won the Kirkcudbright district society's premium; in 1896 he gained the Machars of Wigton premium; and in 1897, 1898, and 1899 he was again hired by the Kirkcudbright district.

Baron Again's dam, Peerless (28,346, C.S.B., imp.), gained in 1911 third prize at Kirkcudbright, second at Castle Douglas, and first prize at Dumfries, beating the mares that had previously beaten her. In New Zealand she won the following prizes, viz:—In 1912 first and champion prizes at Gore and Tapanui and third prize at Invercargill, being beaten by the imported mares Baron's Brilliant and Agatha; in 1913 she was not shown; in 1914 she won first and champion prizes at Keko and Gore. Her sire, Perfect Motion (13,123, C.S.B.), gained in 1907 second prize at the Highland Society's show, Edinburgh, and in 1909 first prize at the Glasgow stallion show. Second dam, Peeress (16,388, C.S.B.), by Sir

Christopher (10,286, C.S.B.); third dam, Pride of Glamis (14,062, C.S.B.), by Main's of Aries (10,379, C.S.B.); fourth dam, Princess (11,086, C.S.B.), by Holyrood (4,446, C.S.B.); fifth dam, Princess Alice (6,626, C.S.B.), by famous Macgregor (1,487, C.S.B.); sixth dam, Jean II. (1,639, C.S.B.), by Prince of Kelvin (656, C.S.B.); seventh dam, Jean, by Salmon's Champion (737, C.S.B.); eighth dam, Darling, by Wellington (1,348, C.S.B.).

Baron Again won the following prizes:—In 1920 second prize in his class, Sydney Royal show, and Breeders' cup (25 guineas) for best colt bred by owners; first prize in three-year-old class at Melbourne Royal show, 1920; and first in £100 Government shield; also first and champion prizes at Werribee in 1920 and first and champion prizes at Kyneton in 1920.

BOLD WYLLIE.

Bold Wyllie (1,095, N.Z.C.S.B., Mitchell and O'Brien's, imported from New Zealand), bay horse, foaled 1918; bred by J. G. Wyllie, Rosebery Farm, Outram, New Zealand.

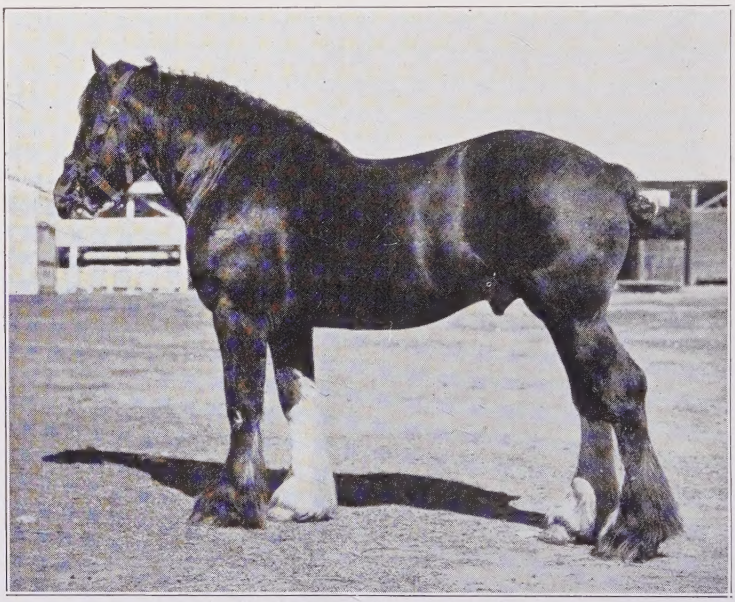


PLATE 32.—"BOLD WYLLIE."

Sire.—Baron Bold (674, A.D.H.S.B.) (C) (got in Scotland, foaled in Victoria), gained first and champion prizes at Christchurch and Dunedin in 1911, 1912, 1913, 1914, and 1915. He also won the Clydesdale Horse Society's Cup at Dunedin and twice gained the Otago Challenge Cup. Grandsire, Baron's Pride (9,122, C.S.B.), was awarded numerous local prizes as a youngster, and in 1894, when four years old, was first and champion male Clydesdale exhibited at the Highland and Agricultural Society's show, Aberdeen; he also gained first prize at Glasgow show. In 1894 and 1895 he won the Kirkcudbright District Society's premium; in 1896 he gained the Machars of Wigton premium; and in 1897, 1898, and 1899 he was again hired by the Kirkcudbright district. G. grandsire, Sir Everard (5,353, C.S.B.), won in 1888 first prize at Glasgow and the Renwick and Aucrencairn district of Kirkcudbright premium; in 1889 and 1890 he won the Glasgow premium; in 1891 he was the Kintyre district of Argyleshire club horse; in 1892 he gained the Kintyre district of Argyllshire premium; in 1893 the western district of Dumbartonshire premium; in 1894 the central district of Banffshire premium; and in 1897 and 1898 he was the lower ward of Renfrewshire stud horse. G.g. grandsire, Top

Gallant (1,850, C.S.B.), won in 1880 the Glasgow premium and first prize at the Glasgow May show. G.g.g. grandsire, the famous Darnley (222, C.S.B.), who was one of the greatest sires of his time in Scotland.

Bold Wyllie's dam, Bragg (848, N.Z.C.S.B.), by Marconi (11,817, C.S.B., imp.), who won in 1904 the Glasgow premium; second dam, Doll, by Richmond (496, N.Z.C.S.B.), by Pride of Richmond (214, A.C.S.B.), by Gallant Scotsman (Town's imp.), by Young Lord Lyon (9/4, C.S.B.); third dam, Fan, by McGregor (497, N.Z.C.S.B.), by Awa Moa (108, N.Z.C.S.B.), by Young Banker (1,354, C.S.B., imp.); fourth dam, Jess, by Sir Colin (3,188, C.S.B., imp.), who gained many prizes as a yearling and two-year-old at local shows and first prize at Paisley a few days before being exported. In New Zealand in 1873 he gained second prize at Taieri.

PREMIER AGAIN.

Premier Again.—D. Greig's Premier Again (1,634, N.Z.D.H.S.B.), imported from New Zealand; bay colt; foaled November, 1917, and stands about 16½ hands high.

Sire.—Premier Pride (11,845, C.S.B., imp., and 68, N.Z.C.S.B.) won as a two-year-old first prize at the Royal Show, London, and first prize at Castle Douglas; in New Zealand he gained first and champion prizes at Ashburton in 1917. His progeny have won many prizes in New Zealand, including first prize at the Canterbury metropolitan show in 1912 for four colts or fillies, the progeny of one stallion. G. grandsire, Baron's Pride (9,122, C.S.B.) was one of the best breeding horses in Scotland. He was awarded numerous prizes as a youngster, and in 1894, when four

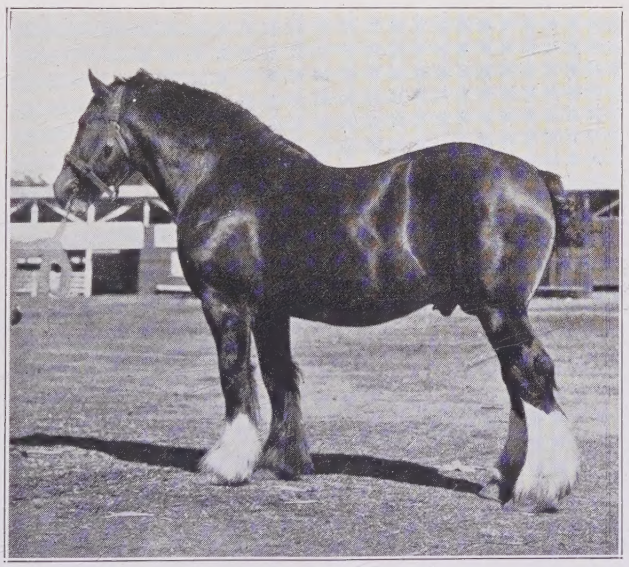


PLATE 33.—"PREMIER AGAIN."

years old, was first and champion male Clydesdale exhibited at the Highland and Agricultural Society's show, Aberdeen; he also gained first prize at Glasgow show. In 1894 and 1895 he won the Kirkcudbright premium, in 1896 the Machars of Wigton premium, and in 1897, 1898, and 1899 he was again hired by the Kirkcudbright district. G.g. grandsire, Sir Everard (5,353 C.S.B.), winner of first prize at the Glasgow show as a three-year-old in 1888 and the premium of £150 at the same show in 1890 and 1891. G.g.g. grandsire, Top Gallant (1,850, C.S.B.). G.g.g.g. grandsire, Darnley (222, C.S.B.).

Dam.—Heather Bell III. (2,717 N.Z.D.H.S.B.), by Black Knight (imp.) (12,860, C.S.B.), by Hillhead Chief (10,774, C.S.B.), by Scottish Crown (9,851, C.S.B.);

second dam, Young Heather Bell (2,204, N.Z.D.H.S.B.), by Sandy Erskine (imp.) (10,900, C.S.B.), who won first and champion prizes at Oamaru and Dunedin shows in 1900 and 1901, by Prince Alexander (8,899, C.S.B.); third dam, Heather Bell, by British Monarch (271, N.Z.D.H.S.B.), by British Lion (270, N.Z.D.H.S.B.), by Argyle (2,567, C.S.B.), by Large Jock (444, C.S.B.); fourth dam, Young Bell, by Prince Victor (imp., 652, C.S.B.), by Prince of Wales (673, C.S.B.), who was winner of numerous prizes; fifth dam, Heather Bell, who was champion mare in New Zealand from Dunedin to Christchurch for many years, by Heather Jock (142, A.D.H.S.B.), by Blackleg (imp., 71, C.S.B.).

Premier Again was second at Christchurch parade 1920, first at Kirwee and Lesston as three-year-old, the only times shown. He has served one season at the stud, and his mares are well in foal, and holds the New Zealand Government four-year-old certificate. This horse holds the New Zealand and the Victorian certificates of soundness.

GLENALLA.

Glenalla (1,484, N.Z.C.S.B., Mitchell and O'Brien's, imported from New Zealand); bay colt; foaled 1919; bred by Mr. J. McGill, Sedgemere, New Zealand.

Sire.—Dunure Coral (16,562, C.S.B., imp.); grandsire, Baron of Buchlyvie (11,263, C.S.B.), who was sold at auction for £9,500. He gained in 1905 and 1907 the Strathmore district of Forfarshire premiums; in 1906 the Girvan district of Ayrshire premium; in 1908 the central district of Ayrshire premium. G. grandsire, Baron's Pride (9,122, C.S.B.), was awarded numerous local prizes as a youngster,

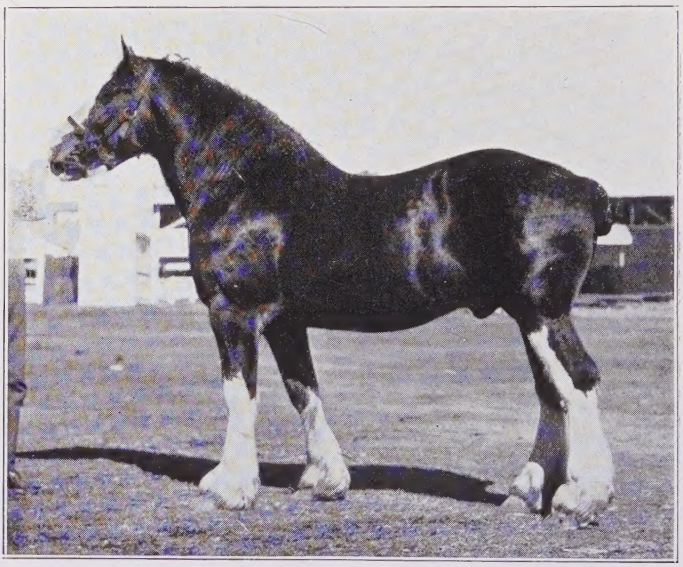


PLATE 34.—"GLENALLA."

and in 1894, when four years old, was first and champion male Clydesdale exhibited at the Highland and Agricultural Society's show, Aberdeen; he also gained first prize at Glasgow show. In 1894 and 1895 he won the Kirkcudbright District Society's premium; in 1896 he gained the Macbars of Wigton premium; and in 1897, 1898, and 1899 he was again hired by the Kirkcudbright district. G.g. grandsire, Sir Everard (5,353, C.S.B.), won in 1888 first prize at Glasgow and the Glasgow premiums in 1889 and 1890. G.g.g. grandsire, Top Gallant (1,850, C.S.B.), won in 1880 the Glasgow premium and first prize at the Glasgow May show. G.g.g.g. grandsire, the famous Darnley (222, C.S.B.).

Glenalla's dam, Nancy, by Sandy's Heir (1,014, N.Z.C.S.B.), by Alexander's Heir (505, N.Z.C.S.B.), by St. Alexander (9,397, C.S.B., imp.); second dam, Bloss, by Glencoe (885, N.Z.C.S.B.), by Vanquisher (1,063, A.D.H.S.B.) (C), by Young Vanquisher (imp., 967, A.D.H.S.B.) (C); third dam, Darling, by Conqueror (564, N.Z.C.S.B.), by Lord Salisbury (1,205, C.S.B., imp.), who was a great prize taker. Glenalla gained in 1922 second prizes at Waitemate and Oamaru.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILK RECORDS FOR JULY, 1923.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			lb.	%	lb.	
Prim	Friesian ...	4 April, 1923	1,110	3·3	42·60	
Miss Security ...	Ayrshire ...	8 June, ,,	840	3·9	38·40	
College Cold Iron	Jersey ..	23 April, ,,	510	5·0	30·00	
Soprano	Ayrshire ...	14 June, ,,	600	4·2	29 40	
College Ma Petite	Jersey ...	12 June, ,,	540	4·4	27·90	
College St. Martha	,, ...	25 June, ,,	468	4·6	25·20	
Rainfall of Marinya	Ayrshire ...	29 Mar., ,,	600	3·6	25·20	
College Prima Donna	Friesian ...	19 Mar., ,,	630	3·4	24·90	
College Grandeur	Jersey ...	11 July, ,,	360	5·6	23·80	
College Evening Glow	,, ...	5 April, ,,	420	4·8	23·70	
Lady Loch II. ...	Ayrshire ...	20 April, ,,	570	3·6	23·70	
Lady Peggy ...	,, ...	20 Dec., 1922	390	4·8	23·10	
Snowflake	Shorthorn	17 April, 1923	570	3·5	23·10	
Mistress May ..	Ayrshire ..	20 June, ,,	510	3·8	22·80	
Comedienne ...	Jersey ...	11 July, ,,	418	4·5	22·22	
Charming Damsel	Ayrshire ...	27 April, ,,	510	3·7	21·90	
Lute	,, ...	26 April, ,,	510	3·6	21·30	
Auntie's Lass ...	,, ...	18 April ,,	420	4·2	20·70	
Lady Mitchell ...	Friesian ...	1 May, ,,	510	3·5	20·70	

A SUMMARY OF SOME EXPERIMENTS CARRIED OUT BY THE BUREAU OF SUGAR EXPERIMENT STATIONS.—IX.

The Director of Sugar Experiment Stations, Mr. H. T. Easterby, commenced this series in the May (1922) Journal, and in his opening article discussed deep cultivation experiments and tabulated comparative crop result from subsoiled and non-subsoiled fields. The second instalment, an account of results of irrigation experiments and the action of irrigation and manures upon the density and purity of sugar juices, appeared in the June (1922) issue. In the August number Mr. Easterby's notes covered experiments in fertilisation, and were followed in the succeeding issue by an account of distance experiments and resultant crops. In the October (1922) number the summary was continued with notes on the introduction and testing of cane varieties. In the February Journal experiments to determine if cane sets cut from arrowed canes have a prejudicial effect on the germination and subsequent yield were discussed. In his introduction to the Summary of Experiments above mentioned, the Director stated that a summary of the chemical work accomplished by the Bureau, to be prepared by Mr. George R. Patten, formerly Chief Chemist to the Bureau, would also be presented. Mr. Patten has now completed this summary, which entailed a great deal of elaborate work and occupied much time. The results will appear from time to time in the Journal until complete, when the whole summary will then be published in bulletin form.—Ed.

SOIL AND OTHER CHEMICAL ANALYSES—*continued.*

Summarised by GEORGE R. PATTEN, Analyst, Agricultural Laboratory, Brisbane, formerly Chief Chemist, Bureau of Sugar Experiment Stations.

The analyses in the following pages deal principally with feedstuffs such as cane leaves, grasses, various cane top ensilage; also the proportions of nitrogen in trash

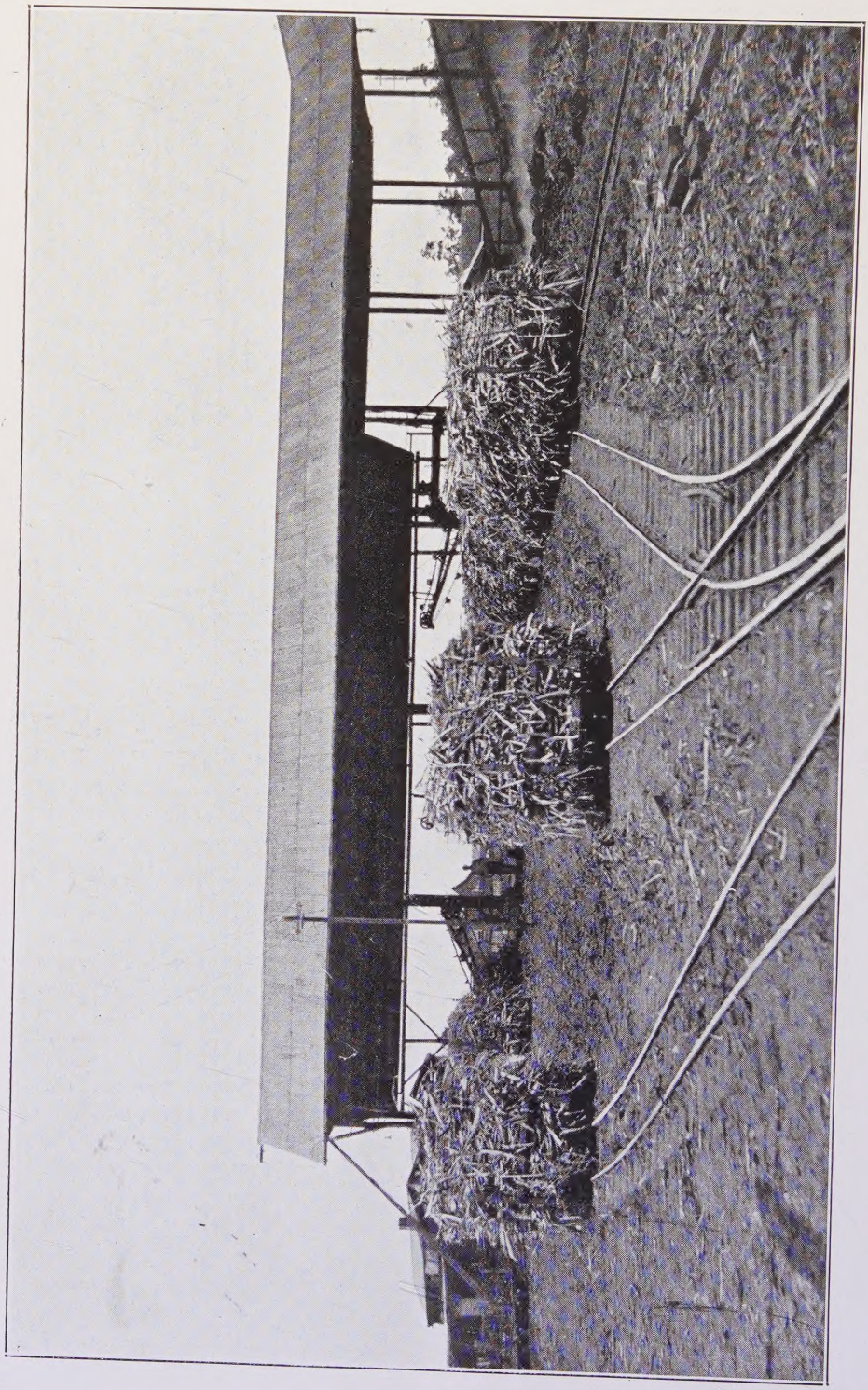


PLATE 35.—CANE AT THE CARRIER, SOUTH JOHNSTONE SUGAR MILL.

and green cane leaves. Several of these analyses were made for the Sugar Bureau by the Agricultural Chemist.

MISCELLANEOUS ANALYSES.

ANALYSES OF CANE LEAVES FOR ESTABLISHING THE RELATIVE NUTRITION VALUES OF VARIETIES.

Constituent.	Green Substance.	Dry Substance.
1.—VARIETY: NEW GUINEA 15, BADILA.		
Moisture	Per cent. 74·700	Per cent. 00·000
Dry substance	25·300	100·000
Crude fibre	6·244	24·680
Total nitrogen	·257	1·018
× 6·25 = to proteids	1·609	6·362
Albuminoid nitrogen	·219	·868
× 6·25 = to proteids	1·372	5·425
Amide nitrogen (diff.)	·038	·150
Ether extract	·536	2·120
Carbohydrates (less fibre)	15·064	59·542
Total ash	1·886	7·456
Soluble ash	1·845	7·296
Albuminoid ratio	1 : 12·0	
2.—VARIETY: SOUTH AFRICA, YUBAN.		
Moisture	73·100	00·000
Dry substance	26·900	100·000
Crude fibre	8·079	30·035
Total nitrogen	·319	1·188
× 6·25 = to proteids	1·997	7·425
Albuminoid nitrogen	·271	1·010
× 6·25 = to proteids	1·697	6·312
Amide nitrogen (diff.)	·048	·178
Ether extract	·655	2·436
Carbohydrates (less fibre)	14·719	54·720
Total ash	1·495	5·560
Soluble ash	1·448	5·384
Albuminoid ratio	1 : 9·6	

The analyses of these varieties were carried on from what may be called the feeding standpoint. The Yuban cane, a South African variety, is a heavy cropper, the crop comprising an enormous number of sticks, which, however, are very small in diameter. Although the sugar content is fair, the amount of labour engaged in the harvesting of this variety renders it economically undesirable as a sugar producer. As a feeding crop, however, it is most useful, and has already gone out from the stations to farmers who intend to use it solely as a forage crop. The analysis of New Guinea 15, natively known as "Badila," was made in order to furnish a comparison with the South African variety. As analytical tables have shown, New Guinea 15 is one of the finest sugar-producing varieties in the State.

ANALYSES OF GRASSES.

The following analyses were made to determine the nutritive value of certain feedstuffs growing at the Mackay Experiment Station. Both the grasses analysed—namely, Paspalum dilatatum and Guinea grass—are largely used in the Mackay district for feeding stock. Two analyses of paspalum are given, one of the young grass, and the other of a much older crop. In places where the grass is grazed, however, the shoots are generally always more or less young, and it will be seen that at this stage it contains the largest amount of protein, the most necessary and expensive ingredient of feeding stuffs. The Paspalum dilatatum is shown to be superior to the Guinea grass in proteids and carbohydrates.

ANALYSES OF PASPALUM DILATATUM GROWN AT THE EXPERIMENT STATION, MACKAY.

Constituent.	YOUNG CROP.		OLD CROP.	
	Green Substance.	Dry Substance.	Green Substance.	Dry Substance.
	Per cent.	Per cent.	Per cent.	Per cent.
Moisture	74·400	00·000	66·731	00·000
Dry substance	25·600	100·000	33·269	100·000
Crude fibre	7·680	30·000	10·167	30·560
Total nitrogen	·372	1·456	·169	·509
× 6·25 = to proteids	2·329	9·100	1·056	3·181
Albuminoid nitrogen	·307	1·200	·141	·424
× 6·25 = to proteids	1·920	7·500	·881	2·650
Amide nitrogen (diff.)	·065	·256	·028	·085
Asparagine	·350	1·371	·150	·455
Ether extract	·788	3·080	1·550	4·660
Carbohydrates (less fibre)	12·790	49·961	17·814	53·547
Total ash	2·070	8·088	2·704	8·128
Soluble ash	1·927	7·528	2·568	7·720
Nutritive value	..	..	22·357	67·213
Nutritive ratio	..	..	1 : 20·1	1 : 20·1

ANALYSIS OF GUINEA GRASS GROWN AT THE EXPERIMENT STATION, MACKAY.

Constituent.	Green Substance.	Dry Substance.
	Per cent.	Per cent.
Moisture	78·450	00·000
Dry substance	21·550	100·000
Crude fibre	8·132	37·736
Total nitrogen	·238	1·108
× 6·25 = to proteids	1·487	6·925
Albuminoid nitrogen	·161	·747
× 6·25 = to proteids	1·006	4·668
Amide nitrogen (diff.)	·058	·271
Asparagine	·310	1·451
Ether extract	·707	3·280
Carbohydrates (less fibre)	8·918	41·385
Total ash	2·474	11·480
Soluble ash	2·391	11·096

ANALYSIS OF PANICUM MUTICUM.

With the object of determining the value of the above grass for fodder purposes, an analysis was carried out. This grass is very common in some of the Northern districts, and is much relished by stock of all kinds, who seem to prefer it to any other grass

ANALYSIS OF PANICUM MUTICUM GROWING AT SUGAR EXPERIMENT STATION

Constituent.	Green Substance.	Dry Substance.
	Per cent.	Per cent.
Moisture	75·330	..
Dry substance	24·670	100·000
Crude fibre	8·270	33·525
Total nitrogen	·204	·825
× 6·25 = to proteids	1·275	5·156
Albuminoid nitrogen	·197	·797
× 6·25 = to proteids	1·231	4·975
Amide nitrogen	·007	·028
Asparagine	·037	·151
Ether extract	·487	1·975
Carbohydrates (less fibre)	12·609	51·122
Total ash	2·036	8·253
Soluble ash	1·881	7·626
Nutritive value	14·979	60·721
Nutritive ratio	1 : 10·8	1 : 10·8

ANALYSIS OF CASSAVA ROOTS GROWN AT THE SUGAR EXPERIMENT STATION, MACKAY.

Cassava roots make an excellent food for pigs if proper precautions are taken. Dangerous proportions of Hydrocyanic (Prussic) Acid were found in the roots, but this is easily got rid of by chopping up the roots, boiling them, running the water off, rinsing in cold water, and again running this water away. The roots are then ready for use.

ANALYSIS OF CASSAVA ROOT GROWN AT THE EXPERIMENT STATION, MACKAY.

Constituent.	Fresh Substance.	Dry Substance.
	Per cent.	Per cent.
Moisture	60·650	00·000
Dry substance	39·350	100·000
Crude fibre	1·196	3·040
Total nitrogen	·178	·452
× 6·25 = to proteids	1·112	2·825
Albuminoid nitrogen	·087	·222
× 6·25 = to proteids	·545	1·387
Amide nitrogen (diff.)	·090	·230
Asparagine	·484	1·232
Ether extract	·354	·904
Carbohydrates (less fibre)	35·949	91·357
Total ash	·818	2·080
Soluble ash	·739	1·880

As stock of all kinds feed upon the Water Hyacinth, now choking the Mackay Fresh Water Lagoons, adjacent to which the Experiment Station is situated, an analysis of the plant was made to find its feeding value. This is relatively poor, owing largely to the high water content. It is, however, a good standby in time of drought, and though a serious pest, is not without its uses :—

ANALYSIS OF WATER HYACINTH GROWING IN LAGOON, NEAR EXPERIMENT STATION.

Constituent.	Green Substance.	Dry Substance.
	Per cent.	Per cent.
Moisture	90·650	..
Dry substance	9·350	100·000
Crude fibre	1·367	14·624
Total nitrogen	·127	1·357
× 6·25 = to proteids	·793	8·481
Albuminoid nitrogen	·117	1·252
× 6·25 = to proteids	·731	7·825
Amide nitrogen (diff.)	·010	·105
Asparagine	·053	·562
Ether extract	·276	2·960

ANALYSIS OF WATER HYACINTH GROWING IN LAGOON, NEAR EXPERIMENTAL STATION—*continued.*

Constituent.	Green Substance.	Dry Substance.
	Per cent.	Per cent.
Carbohydrates (less fibre)	5·423	57·997
Total ash	1·499	16·032
Soluble ash	1·463	15·648

SUGAR-CANE TOPS ENSILAGE.

	Per cent.
Moisture	78·09
Dry matter	21·91
Crude protein	1·34
True protein	·66
Ash	2·72
Crude fibre	8·87
Crude fat	·79
Carbohydrates, &c. (diff.)	8·19
Total N.	·214
Proteid N.	·105
Amide N.	·075
Ammonia	·034
Acidity as lactic acid	1·73

This silage is made every year at the Sugar Experiment Station, Bundaberg, its feeding value is low, but is an assistance during dry weather mixed with other foodstuffs.

NITROGEN DETERMINATION IN CANE LEAVES.

PROPORTIONS OF NITROGEN, DRY CANE LEAVES (TRASH), AND GREEN CANE LEAVES.

Variety.	Moisture.		Nitrogen.			
	Trash (Dry Leaves).	Green Leaves.	Trash (Dry Leaves), including Water.	Trash (Dry Leaves), Water Free.	Green Leaves (Fresh Substance), including Water.	Green Leaves (Dry Substance). Water Free.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Badila	11·60	69·80	0·356	0·403	0·314	1·040
Trinidad 60	10·80	68·00	0·416	0·466	0·383	1·199
New Guinea 4 ..	8·80	68·00	0·458	0·502	0·395	1·235
,, 8A ..	8·80	67·60	0·346	0·379	0·360	1·112
,, 24 ..	9·60	64·80	0·584	0·646	0·430	1·222
,, 24A ..	11·40	67·40	0·360	0·406	0·388	1·191
,, 24B ..	10·60	69·20	0·339	0·379	0·360	1·169
,, 64 ..	9·40	68·00	0·493	0·544	0·500	1·563
Bois Rouge	9·60	66·40	0·549	0·607	0·374	1·114

Attention has been called to the loss of nitrogen that takes place when cane trash lies upon the surface of the ground and not ploughed in. As soon as the dead leaves begin to rot, the nitrogen is converted into ammonia, and escapes back into the air in its gaseous form. The data contained in the above table make this loss of nitrogen still more clear.

IRRIGATION IN QUEENSLAND—III.

By H. E. A. EKLUND, late Hydraulic Engineer, Queensland Water Supply Department.

A continuation of a comprehensive survey of irrigation possibilities in Queensland. Mr. Eklund was formerly in the State Service as an Hydraulic Engineer and as Executive Engineer in charge of the Inkerman Irrigation Works in North Queensland, and is now engaged on an important water supply project in South Australia. The widespread interest now centred upon land settlement in Queensland, and the general practical development of the forward Government policy in relation to Agricultural extension and the enrichment of rural life in this State, makes the publication of Mr. Eklund's observations particularly timely. The review will be continued through succeeding issues of the Journal.—Ed.

IRRIGATION IN THE WEST.

"I have watered the barren land ten leagues wide,
But in vain I have tried, and in vain I have tried
To show the sign of the Great All Giver
The word to a people—Oh! Lock your river."

Practically the whole of the State west of the Dividing Range consists of open undulating plains, which in a good season have the appearance of well cultivated fields. These plains are truly "stored fertility under rainless skies." In years to come when water is made available these plains should be the granaries of the world. But until then the production of wool and mutton will remain the principal primary industries. Calculating the utility of this region on the basis of one sheep to every three acres, there is room in this State alone for over 85,000,000 sheep besides a good supply of cattle. Up to the present the largest number of sheep shown by statistics as having been depastured in any one year is only about 24,000,000.

But no one who has not seen the West in a drought can imagine the difficulties which beset the pastoral industry. Until the advent of artesian water "relief country" may have been more plentiful than at present, but when food for stock and water became scarce, the difficulties in removing stock from one locality to another were serious.

The discovery of artesian water marked a new era in pastoral pursuits, but the knowledge that water could be obtained by boring resulted in what now appears to have been a competition of waste. Boring was carried out indiscriminately without system or method; anywhere, anyhow.

Not till 1910, or nearly thirty years after the first flow had been struck, did it become sufficiently apparent that control was necessary to enable the passing of suitable legislation.

The first artesian bore in Australia was sunk in 1879 by David Brown,* of Kallara Station in New South Wales, and the first artesian water in Queensland was obtained (according to the Hon. S. Fraser)† when J. S. Loughead, drilling for the Squatting Investment Company, struck a flow on Thurulgoona, in February, 1886. Sometimes a controversy arises as to when artesian boring was first commenced in this State, and to whom the credit is due.

In a pamphlet by the Hon. Simon Fraser it is claimed that the first flowing bore in Queensland was put down on the Thurulgoona Run, in the southern portion of the State. Even here it is acknowledged that the Water Supply Department, in

* It is worth noting here that Mr. Brown's efforts were largely due to the opinions expressed by Mr. Russell, the Government Astronomer of New South Wales at the time. To the latter must go the credit of having, from careful observation of rainfall and river gaugings, deduced the fact that underground waters existed. And after all this there are people who still talk of the plutonic origin of the artesian water.

† "True Story of the Beginning of the Artesian Water Supplies of Australia."

1882, has procured "four boring machines . . . and an attempt was made to probe still deeper beneath the surface of the earth in the hope of tapping a subterranean supply of water." This "True Story of the Beginning of the Artesian Water Supply of Australia," then deals only with the success of the private enterprise in obtaining this flow, but states later that the Hydraulic Engineer's report for the year ending 1887 "tends to obscure the fact that it was the success of the Canadian Pole Tool at Thurulgoona which first drew departmental attention to the work of Loughead's party."

From an examination of departmental reports it is quite clear that since 1882 consistent efforts were made on every possible occasion to induce the Government of the day to procure machinery and men capable of deep well boring.

At last these recommendations were acted upon and a suitable plant was procured and put in charge of a Mr. Arnold, who was sent to Blackall in 1885, after the Government Geologist, Mr. R. L. Jack, and Mr. J. B. Henderson, Government Hydraulic Engineer, had conjointly travelled over the western area and picked sites, in their opinion, suitable for deep boring.

This bore at Blackall was not completed till 1888; but to any unbiased mind perusing early records it is quite clear that the Water Supply Department of the

Plate 36.—Measuring the Flow of an Artesian Bore.

State was first in taking active steps to prove the deep well supplies. Private enterprise may have met with the first flow; but, if so, it appears to be one of the vagaries of fortune.

With the advent of artesian water it was thought that irrigation would be largely practised. In some cases attempts were made and fair success appeared at first to attend these experiments. But after a year or more it was found that areas which had been properly saturated with bore water a few times became hard and more or less barren. Chemical analysis of the water showed a certain amount of alkalinity, but hardly sufficient to cause the rapid deterioration of soil observed. It was also noted that though the alkalinity of the water from one bore was greater than that observed in another, yet the effect on the soil of the former was perceptibly less than that from the latter. This phenomenon continued a vexed question until the experiments carried out by Mr. R. S. Symmonds, of the Agricultural Branch in New South Wales, showed that the trouble was largely in the soil. He states that certain constituents of the soil cause the formation of diffusible colloids when acted upon by the alkali in the water, and experiments carried out by him, and others under his direction, support this theory. The colloid so formed causes the soil to set, and it also becomes impervious to air and moisture. Silica being one of the constituents most susceptible to the action of the alkali, sandy soils are stated to suffer more than the purer black clays.

The method used by him to break up the colloid in the soil is by adding a correct proportion of well-diluted nitric acid when the soil is in semi-plastic condition. This is said not only to restore friability, but also to increase the fertility.

Mr. Symmonds has also suggested a method of utilising the pressure from artesian bores to generate electricity and by this means synthetically make nitric acid. As the pressure from the great majority of bores is very small, and flows and pressures constantly diminishing, the idea, though good theoretically, is hardly practicable, for two reasons:—

Firstly, the first cost of such an installation would be too great to show reasonable return on the expenditure; secondly, an artesian bore develops its maximum horse-power when shut back to about half its flow. This would necessitate, for irrigation purposes, a well-constructed bore to every 100 to 300 acres, depending on the flow available. With a diminishing supply, which requires careful nursing to supply our wants for stock and domestic use only, any attempt to use the supply for irrigation on a large scale appears inexpedient.

It is evident that in arriving at his estimate of what could be done by power from artesian bores, Mr. Symmonds has been under a misapprehension. Even engineers not personally acquainted with artesian conditions, or at least not having had any practical experience of artesian bores, have made similar mistakes. One

PLATE 37.—AN ARTESIAN BORE PARTLY CLOSED.

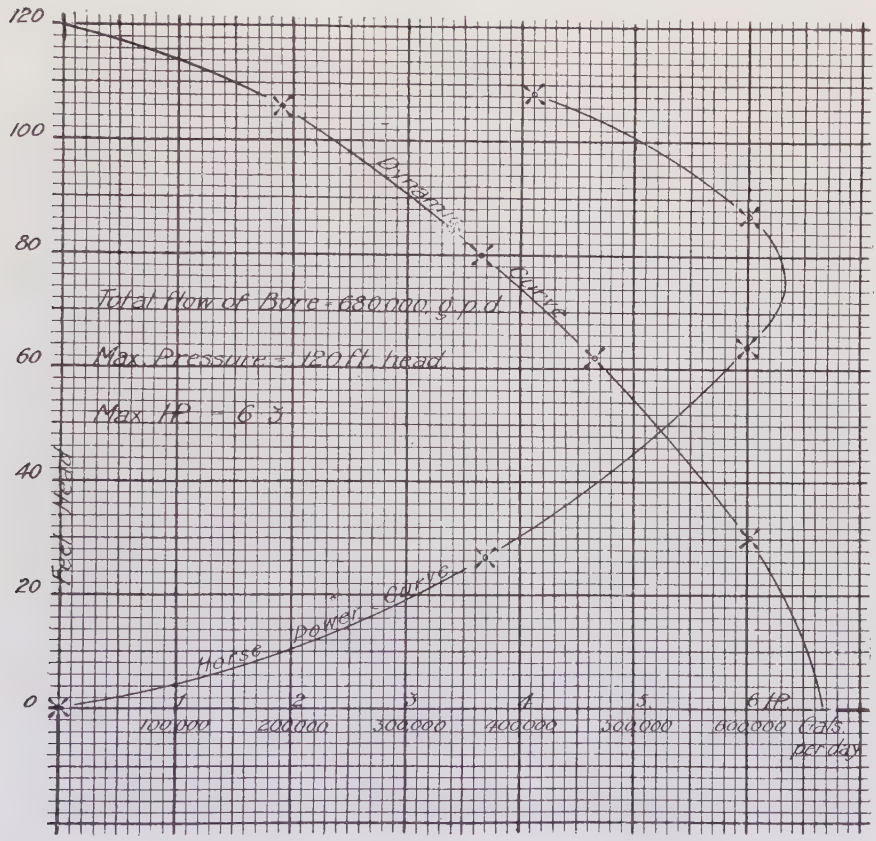
author, a well-known engineer, quotes figures of what appears intended for a statement showing the theoretical horse-power available from bores, but in all cases the power stated is enormously in excess of the true theoretical power, and proportionately in excess of that likely to be obtained in actual practice. The error is quite excusable and is due to the peculiarity that in artesian bores the flowing pressure does not correspond with the static pressure; or, in other words, the hydraulic condition differs from the hydrostatic. Consequently even the theoretical power available can only be determined after careful experimental investigation *of each bore.*

When an artesian bore is first closed down the gauge reading obtained (if the closing has been carefully done) will closely approximate to the hydraulic head. The effect of closing the bore is to change the condition from hydraulic to hydrostatic, the result being that the pressure shown increases after closing. This is due to several causes, and the rate of the increase in the pressure shown is governed by at least two factors, the principal one being the porosity of the rock, the other being the amount of gas present. After the bore has been closed a certain time, which differs more or less in all bores, a maximum pressure is reached, which is the true static pressure. The true flowing pressure can only be deduced after the static head has been obtained, and the former is always less than the latter. But there is no pressure shown on the gauge until the aperture through which the water-

issues is restricted, consequently the effective pressure at maximum flow is nil. So also at maximum pressure the flow is nil. Hence the effective "pressure-flow" is somewhere between maximum and nil, and the pressure at which this flow is obtained can only be ascertained by experiment.

After a pressure gauge has been attached to the casing and a weir put in the drain for measuring the flow, the stop-valve on the bore is slowly turned. At every half turn or so, depending on the accuracy required, and after the flow over the weir has reached equilibrium, a reading is taken on the weir. From these two observations, repeated at intervals, the dynamic curve is first plotted. From this curve can be obtained the flow, with the pressure, at as many points as desired. With this information the horse-power curve is plotted, which will show the actual maximum theoretical horse-power available. From this figure a further deduction must be made, depending on the efficiency of the motor intended to be used; but it is generally safe to say that the actual horse-power obtainable in practice is about half of that shown by the experiment.

Below is given an actual observation and the horse-power curve plotted therefrom.



DYNAMIC AND H.P. CURVES.

The dynamic curve is plotted from the readings on weirboard and pressure gauge as below:—

Pressure x 2.307 = Ft. Head.		Flow from Tables.		Points on horse-power curve.
30	..	600,000	..	3.7 h.p.
62	..	465,000	..	6 h.p.
80	..	365,000	..	6 h.p.
103	..	190,000	..	4.1 h.p.

The formula used is $\frac{H \times W \times Q}{33000}$

where H = head in feet.
W = weight per gallon.
Q = number of gallons per minute.

It is fairly evident that if irrigation is ever to be freely practised in the West it will not be done with artesian water. The Western soil responds best when treated with surface waters, and it is not too soon to carefully investigate possible irrigation schemes west of the Range, even if small, to ensure better uniformity in stock and wool supplies.

In view of the fact that the artesian flowing water supply is diminishing, the question of cheap power for water-raising purposes requires attention, but as it is beyond the object herein aimed at it will only be referred to briefly.

The essentials of any water-lifting appliance, briefly enumerated in order of their importance, are:—

1. It must be reliable and simple;
2. Operate at a low cost or be highly efficient;
3. Working parts must be readily accessible for inspection or repairs; and
4. Require as little attention as possible.

If reliability were the only requisite many good standard makes of engine would fill the bill. But the necessity for cheapness practically debars steam from competition in the West, on account of the high cost of fuel and consequently prohibitive cost of operating. It is chiefly because of the higher efficiency shown by internal combustion engine that they hold the pride of place. They are most frequently employed as auxiliaries to windmills, but are sometimes the only power used and while not so simple or reliable as steam engines they have many advantages. They are more convenient, the cost per horse-power is less, both first and operating, and they require less attention. Where wood is plentiful the hot air engine should be appreciated, and it is rather surprising to find that it is not more in use on the coast.

The design of oil and petrol engines is improving, and the efficiencies obtained certainly tend to increase, but the price of fuel here is ever increasing at a very rapid rate. We have as yet little or no prospect of obtaining petrol locally, and even if oil is obtained within the Commonwealth it is likely to remain dear. There is practically only one other kind of fuel—namely, alcohol—which, though not as convenient as petrol, yet has many advantages.

Alcohol Engines.

The calorific value of alcohol is about three-fifths that of petrol, but it is safer to carry and handle, will stand a higher compression when gasified and mixed with air, and should, therefore, give a much better efficiency than any yet obtained in actual practice. Alcohol is a much cleaner fuel than petrol and carbon deposits are practicaly unknown in the engine. It has, when burnt, rather a pleasant smell, but the engine will not "start up" on alcohol when cold. Any ordinary petrol engine when hot will work on alcohol without any alteration to the carburetter, but will under such conditions use from two to three times more alcohol than petrol, for the same amount of work done. The maximum value of alcohol as a fuel cannot be obtained except in a specially designed engine, which, as already stated, does not yet appear to have reached a reasonable amount of perfection. The matter is clearly one of relative costs, and if the price of alcohol per gallon were, say, half that of petrol, there is not the slightest doubt that inventors would turn their attention in this direction.

Alcohol can be and is manufacured within the Commonwealth, and must sooner or later become our chief fuel for motors unless petrol should be obtained on this continent. Alcohol is a product that can be cheaply made from a number of new materials, and if it were manufactured on a larger and cheaper scale the money now leaving the country for petrol and other oil fuels would be retained.

Geoffrey Martin and his assistants in "Industrial and Manufacturing Chemistry" under "Benefits of Industrial Alcohol to Agriculture," state that—

"Alcohol can be produced in practically unlimited quantities from a great variety of farm produce, so that every kind of soil and climate can be utilised. It can even be made from spoiled crops, corn stalks, refuse, &c. The alcohol so produced furnishes a cheap and excellent motive power for engines . . . for sunshine only is required for the production of the starchy materials from which alcohol is produced and there is no exhaustion of the soil in the process. Only carbon hydrogen and oxygen are withdrawn from the air under the influence of sunlight, and after the combustion of the alcohol they come back as carbon dioxide and water. The nitrates, phosphates, lime, &c., absorbed from the soil by the growing vegetation all remain in the immediate neighbourhood in the liquid waste from which the alcohol has been distilled, and being used as fodder are returned to the ground as manure."

The most profitable way of obtaining alcohol from vegetation is by growing potatoes, which give a heavier and a cheaper yield of starch than any other vegetable. There is no better giver of the starch and sugar necessary for alcohol than the sweet potato, which is particularly easily grown in Queensland, especially with irrigation.

The United States Department of Agriculture, in their Bulletin No. 277, 1915, publish a record of an investigation carried out to ascertain users' opinion of the alcohol engine as compared with other prime movers:—Out of 130 farmers using the engine, 46 per cent. thought them equal to the engines they had previously used; 47 per cent. considered that the new engine was better; and only 4 per cent. held the opinion that it was inferior; these last 4 per cent. stating, however, that the steam engine which they had previously used required more attention. As regards cost of maintenance 9 per cent. found the alcohol engine more costly, 34 per cent. stated "no difference," 57 per cent. holding the opinion that it was considerably cheaper.

The Bulletin concludes with some remarks of which the following are of interest:—

"An engine designed for gasolene (petrol) or kerosene can without any material alterations to adapt it to alcohol be made to give slightly more power than when operated on petrol or kerosene, but this increase is at the expense of a greater amount of fuel. By alterations to adapt the engine to the new fuel this excess of power may be increased to about 20 per cent.

"Because of the increased output without increase in size alcohol engines should sell for less per horse-power than gasolene or kerosene engines of the same class."

Apparently, then, there is here an opening for a very great and far-reaching industry. First, the production of cheap alcohol; second, the perfecting and making of an alcohol engine.

Some years ago an attempt appears to have been made by a firm of sugar planters to utilise the waste products of the mill for making alcohol. The encouragement given to them by the State Government at the time appears to have been characteristically opposed to development and advance of industry.

It is extremely gratifying to be able to record the fact that steps are now being taken to fully investigate the possibilities in this direction. The question of a proper denaturant appears to cause some concern, but as it may safely be assumed that in the near future the chief use for alcohol will be for engines, British practice should be followed, and the denaturing agent consist of some product not likely to interfere with its value as a fuel for motors.

(*The next instalment will cover Practical Consideration and Water Supply.*)

"BUNCHY TOP"—SUGGESTED BUFFER AREA.

"Bunchy Top" is recognised as a serious menace to banana-growing, and a deputation representing the Queensland Banana-growers' Institute, which interviewed the Minister for Agriculture and Stock (Hon. W. N. Gillies) recently, advocated the establishment of a buffer area, stretching 20 miles south of the Brisbane River, and the immediate employment of a pathologist to investigate the disease. The deputation, which consisted of Messrs. W. A. Cathcart, W. B. Christie, and E. A. Thelander, was introduced to the Minister by Mr. R. J. Warren, M.L.A.

In the course of his reply to the representations made, Mr. Gillies said that arrangements had been made between the New South Wales and Queensland authorities for a joint investigation. Both Mr. Darnell Smith (the New South Wales Entomologist) and Mr. H. Tryon (Queensland Entomologist) were working on the "bunchy top" problem; but the work was not getting on as quickly as he would like. It appeared to him that if the buffer-area suggestion were adopted the question of compensation would arise and would have to be considered. He would place the deputation's suggestions before the Government, and promised to give them his most serious consideration. He realised that the question was of vital moment to the banana industry, which had possibilities, now that it was protected, of great expansion. He agreed with the deputation that "bunchy top" was a serious menace, and that steps should be taken to check it, but he did not think that it was due to bananas being grown too far south. The excellent bananas grown on the Clarence River disproved that theory. "Bunchy top" must be thoroughly investigated scientifically and the cause and remedy discovered. It had been said that it was a root disease; but while this was all very well, it was not sufficient. For his part, he considered that the whole question was one that should go before the Council of Agriculture. As Minister for Agriculture, he promised to study the whole matter, and would do the best he could for them with the money available.

His Excellency the Governor, Rt. Hon. Sir Matthew Nathan, President.

Reading from the President's right to left, alternately—

Hon. E. G. Theodore (Premier).

Hon. W. McCormack (Home Secretary).

Hon. W. N. Gillies (Minister for Agriculture and Stock).

Hon. J. Harry Coyne.

Hon. John Huxham (Minister for Education).

Hon. John Mullan (Attorney-General).

Hon. W. Forgan Smith (Minister for Works).

Hon. James Larcombe (Minister for Railways).

Hon. James Stopford (Home Secretary).

Hon. Alf. J. Jones (Minister for Mines).

Mr. Geo. W. Watson (Clerk to Executive Council).

Plate 38.—The Queensland Executive Council.

STATE STATIONS AND CLOSER SETTLEMENT.

In the Legislative Assembly recently the Minister in Charge of State Enterprises (Hon. W. Forgan Smith), replying to a question as to the intention of the Government to subdivide any of the State stations for closer settlement, said the intentions would be disclosed at the proper time. Before its acquisition by the Government Dillalah Station had been surveyed for closer settlement purposes. Asked whether Dillalah Station would be opened for grazing selections, Mr. Forgan Smith repeated that the Government would disclose its intentions in due course. The complaint that Dillalah State Station was a breeding-ground for dingoes was entirely without foundation, and was merely a phase of the propaganda indulged in by people having certain interests to serve.

IMPROVING THE BREED OF HORSES AND NEW LEGISLATION.

In explaining the Bill to improve the breed of horses and for incidental purposes, which was introduced in Parliament recently, the Minister for Agriculture and Stock (Hon. W. N. Gillies) said that all recognised the necessity of improving the breed of horses, draught horses particularly, and the improvement was the more essential in view of the development of the cotton industry. The present Bill, which had been recommended by the Council of Agriculture, did not propose to tax stallions, but to set up a board nominated by the Council of Agriculture, with a qualified veterinary surgeon, nominated by the Government, as chairman, and to proclaim districts. On the Council's recommendation boards would be appointed in the several districts, and annual examinations of stallions would take place. Certificates would be issued to stallions that complied with the necessary standard as to soundness, type, and suitability as sires. It was proposed that after the measure was in operation for a period of two years no stallion which did not possess a certificate should be allowed to be used for stud purposes.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

No. 24.

THE BLUE QUANDONG.

The Blue Quandong (*Elæocarpus grandis*) is a large "scrub" tree attaining a height of about 120 feet and a barrel diameter of about 3 feet. It is one of the buttressed or "spurred" trees of the Queensland rain forests. The timber is light yellow in colour and light in weight. It is used in New South Wales for cabinet work, bee-box frames, &c., and is useful in cases where lightness in weight is requisite. The hard, bony, wrinkled "stones" of the fruit are sometimes made into necklaces and ornaments. Two characteristics of the tree are its yellow-coloured inner bark and sapwood surface, and the deep red colour which the old leaves assume. These features are frequently useful in assisting to identify the species. J. S. Gamble, in his "Manual of Indian Timbers," states that the hard tubercled nuts of *Elæocarpus ganitrus*, an Indian species, are polished, made into rosaries and bracelets, worn by Brahmins and Sanyasis, and sold in quantity at Benares, Allahabad, and Hardwar. He also states that another Indian species, *Elæocarpus oblongus*, is often conspicuous by its leaves turning red. These statements by Gamble show that the ornamental properties of the stone of the Blue Quandong and the peculiar red colour of its old leaves are also characteristic of some Indian species of the genus. The Quandong is found in the rain forests of Eastern Australia from the Nambucca River, New South Wales (J. H. Maiden), to the Endeavour River, North Queensland.

Photo. by the Authors.]

PLATE 39.—THE BLUE QUANDONG (*Elæocarpus grandis*).
A large tree in the rain forest eastward of Traveston, North Coast Line.

Photo. by Dept. of Agriculture and Stock.]

PLATE 40.—THE QUANDONG.
(A) Dry Fruit, (B) Stone or Quandong.

FRUIT FLY INVESTIGATIONS.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) has made available the following report of the Entomologist at Stanthorpe, Mr. Hubert Jarvis, for the months of June (part) and July, 1923, in relation to the fruit fly and other injurious insects.

FRUIT FLY.

Persistency in Stored Fruit.

On 25th June, when examining Rokewood Apples in the Insectary, both the living maggots and pupæ of the Queensland fruit fly were found, *in situ*. In one instance an adult fruit fly was found alive in the centre of the apple in a cavity mined by the larva; this fly was, however, in a crippled condition, and soon perished. Search in stored apples in various parts of the district also revealed occasional fruit fly larvæ and pupæ; in every case these were found in the packing shed, or underneath the house; such situations affording as they do shelter from frosts. A small percentage of maggots and pupæ are thus enabled to survive, and it is probable that a few may pass the winter in this way, the adult flies emerging in the spring. Many experiments are being carried out with such fruit and we shall be able to state definitely, later on, if this is the case or not.

Adult Fruit Fly.

No fruit flies, with the exception of the single instance abovementioned, have hatched during the months of June and July; and it is, I think, unlikely that many examples of *Chætodacus tryoni* can live as adult fruit flies throughout the Granite Belt winter.

Field Experiments.

On 27th June, 1923, fruit fly puparia, 100 in number, which had been buried on 5th May, 1923, in loose soil, at a depth of 2 in., were dug up and examined; all were found to be dead. This was also found to be the case with pupæ buried at a depth of 6 in.

On the other hand, under infested fruit which had been placed on the surface of the ground, and covered with fly-proof gauze, one living fruit fly pupa was discovered. The soil has been sifted under fruit trees which carried maggot-infested late fruit (such fruit being allowed to fall on the ground) but no fruit fly pupæ, dead or alive, have been met with.

In several such experiments as the above, the gauze covers used will remain untouched until the spring, when a careful watch will be kept, for possible fruit flies, which (should they winter in this manner) ought to emerge about October. This wintering, or over-wintering of the Queensland fruit fly in the Granite Belt, is a question of very great importance. Should it migrate by flight into this district every spring (which I think extremely unlikely) its control will prove very difficult indeed. Should it, on the other hand, winter here with us in the maggot or pupa stage, its control should be quite possible, and merely a matter for organised effort.

Co-operation with New South Wales.

On 3rd July, Inspector J. Lindsay, of New South Wales, visited Stanthorpe, and was shown the experiments being carried out here, and the matter of fruit fly control was discussed.

Maggots in Imported Fruit.

On 12th July, living fruit fly maggots were found to be present in imported citrus fruits. This matter was brought to my notice by Mr. McGan, of Stanthorpe, and was at once reported to the Entomologist in Chief, who directed urgent attention to the same. It is, I need hardly state, most important to obviate all risk of a recurrence of this happening, as we are most desirous of securely closing this possible avenue of fruit fly introduction to the Stanthorpe district.

Cold Storage.

Experiments are to be conducted in Brisbane (as has been suggested) by the Department of Agriculture, to ascertain the exact period and temperature required to kill the maggots and pupæ of the Queensland fruit fly (*Chætodacus tryoni*), and it is more than possible that a very much shorter period than the twenty-one days now stipulated will be found sufficient. Should this be so, it will be of the utmost importance not only to fruit agents but also to Stanthorpe fruitgrowers.

Packing Sheds.

A general clean up of packing sheds has been, and is still being proceeded with, and I must strongly urge all growers to see that no shelter is given to the fruit fly, and incidentally to other insect pests. Too much care cannot be exercised in this matter, and a couple of days spent in thoroughly cleaning up the packing shed now, may save much loss and worry later on.

OTHER INJURIOUS INSECTS.

Woolly Aphis of Apple.

On 24th May (in reply to my application) a letter was received from Dr. R. J. Tillyard, M.A., of the Cawthron Institute, New Zealand, promising a consignment of the Woolly Aphis parasite (*Aphelinus mali*) for this district; and on the 14th of this month, another letter was received informing me that the promised consignment of beneficial insects would leave Wellington, New Zealand, on 20th July. This useful insect was introduced into New Zealand by Dr. R. J. Tillyard in 1921, and owing to his great care and skill in rearing same it is now well established in New Zealand, and is doing very good work against the Woolly Aphis (*Shizoneura lanigera*) so harmful an apple pest. During 1922, Dr. Tillyard distributed (as he informs us) 33,000 living aphelinus parasites, to different parts of New Zealand—by post. As regards the life history, &c., of this useful insect, Dr. Tillyard states as follows:—

"*Description.*—This parasite is a tiny chalcid wasp measuring about 1/25 of an inch in length. In shape it is somewhat like a honey bee, but the colour is blackish except for a yellowish band round the base of the abdomen, and another on the antennae. It is an active little insect, and can both jump and fly quickly. The males can be recognised by being slightly smaller and less stoutly built than the females.

"*Life History.*—Immediately on emerging from the chrysalis or pupa the males and females pair. After pairing the male lives only a few days, but the females may live a week or longer. The female begins to search vigorously for Woolly Aphis and proceeds to lay her eggs in them one by one, by stabbing them her sharp ovipositor, at the same time inserting one egg in each aphis. The aphis objects to this, squirms, and often exudes a drop of liquid. In a few days' time, the tiny wasp grub hatches, and proceeds to devour the whole of the internal organs of the aphis, which contains just enough food to bring the grub to full size. When full grown, the grub hardens the shell of the dead aphis into a kind of cocoon, within which it turns to a pupa. After a varying period of time spent as a pupa, the aphelinus emerges as the perfect insect and pairing again takes place.

"During warm summer weather, the complete life cycle of the parasite is gone through in five or six weeks, so that from four to six broods a year can be raised in a fairly warm climate.

"As each female lays fifty or more eggs, the rate of increase is very great, and the parasite is able to catch up with the aphis, and entirely overtake and destroy it before the end of the season. The aphelinus will attack any of the dark-coloured aphids, such as the Black Aphis of citrus trees, and has been known to attack young mealy bug."

All arrangements have been made for the reception and breeding of this parasite, on its arrival, which should be within the next few days.

CODLING MOTH OF APPLE.

The general cleaning up of packing sheds already alluded to has been beneficial in considerably reducing the numbers of this pest. The importance and necessity of this cleaning up was stressed by the Government Entomologist, Mr. H. Tryon, and the Chief Instructor in Fruit Culture, Mr. J. M. Ward, at a meeting of the Stanthorpe District Fruitgrowers' Council, held in Stanthorpe on 28th July. So important did they consider the control of Codling Moth that Mr. Tryon and Mr. Ward made a special visit to Stanthorpe for the express purpose of addressing the Council on this matter. The valuable information and advice given by both the Government Entomologist and the Chief Instructor in Fruit Culture, in relation to the Codling Moth and its control, should prove very helpful. Right spraying, with the right spray at the right time, will undoubtedly have a control of this serious fruit pest.

MISCELLANEOUS.

Tomato Caterpillar.

The injurious caterpillar of the tomato alluded to in my last report has since given rise (in the Insectary) to a small moth. This moth, of which I have so far two examples, emerged from the chrysalis on 25th July.

These caterpillars were obtained on 4th May. On 14th May they assumed the chrysalis form with a web cocoon, the moths emerging on the 25th July.

If this is the normal hatching time of the moth, we might expect another brood in early spring.

The insect has been sent to Dr. H. Jefferis Turner, of Brisbane, for identification.

Fungus Diseases.

Specimens illustrative of fungoid diseases affecting fruit trees, were, through my agency, secured by Mr. Tryon, the Government Entomologist and Pathologist, on his recent visit to Stanthorpe, and were taken by him to Brisbane for identification.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JULY, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JULY, 1923 AND 1922, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	July.	No. of Years' Records.	July, 1923.	July, 1922.		July.	No. of Years' Records.	July, 1923	July, 1922.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	0·96	22	0·52	2 24	Nambour	2·75	27	4·88	3·45
Cairns	1·63	41	0·39	2·50	Nanango	1·79	41	1·29	2·53
Cardwell	1·47	51	0·57	2·05	Rockhampton ...	1·63	52	0·35	3 20
Cooktown	0·99	47	0·16	0·55	Woodford	2·52	36	2·82	2·66
Herberton	0·73	36	1·01	2 21					
Ingham	1·66	31	0·54	2·20					
Innisfail	4·74	42	2·95	3·55					
Mossman	1·61	15	0·05	2·34					
Townsville	0·60	52	0·09	1·48	*Darling Downs.*				
					Dalby	1·82	53	0·23	1·81
Central Coast.					Emu Vale	1·64	27	0·96	2·50
					Jimbour	1·71	35	0·41	1 67
Ayr	0·72	36	0 06	2·10	Miles	1·78	38	0·49	0·95
Bowen	0·98	52	0·47	2·40	Stanthorpe ...	2·08	50	1·57	3·30
Charters Towers ...	0·67	41	0·16	3·99	Toowoomba ...	2·09	51	0·99	3·55
Mackay	1·76	52	1·19	4·66	Warwick	1·85	58	0·97	3·08
Proserpine	1·46	20	0·04	2 50					
St. Lawrence ...	1·31	52	1·45	3·83					
					Maranoa.				
South Coast.									
					Roma	1·51	49	1·08	0·72
Biggenden	1·36	24	0·79	2·58					
Bundaberg	1·95	40	0·90	3·33	*State Farms, &c.*				
Brisbane	2·31	72	2·05	4·68					
Childers	1·71	28	1·00	2·59	Bungeworgorai ...	1·73	9	1·13	0·54
Crohamhurst ...	2·32	30	4·57	3·26	Gatton College ...	1.47	24	0·61	2·12
Esk	2·03	36	1·14	2 89	Gindie	1·12	24	0·42	0·73
Gayndah	1·52	52	1·29	3·16	Hermitage ...	1·87	17	0·74	2·96
Gympie	2·18	53	2.81	2·64	Kairi	1·36	9	0·51	2 73
Glasshouse Mts. ...	2·55	15	*	4·55	Sugar Experiment Station, Mackay	1·62	26	0·74	4·37
Kilkivan	1·71	44	1·50	2·21	Warren	1·41	9	0·75	2·50
Maryborough ...	1·96	52	2·87	2·47					

* Return not received.

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for July this year, and for the same period of 1922, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
State Meteorologist.

THE CITRUS BUG (*ONCOSCELIS SULCIVENTRIS*).

GOVERNMENT ENTOMOLOGIST'S REPORT.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) has received the following report from Mr. Henry Tryon, Government Entomologist and Vegetable Pathologist, dated 6th August, 1923:—

"With reference to the investigations bearing on the control of the Citrus Bug (*Oncoscelis sulciventris*), an insect so prevalent of late seasons throughout the Blackall Range district, initiated by myself (*vide* 'Notes on the Citrus Orange Bug,' 'Queensland Agricultural Journal,' February, 1923, pp. 103-109), and since been prosecuted by the Assistant Entomologist, Mr. A. A. Girault, I may set forth the position that has now been arrived at.

"When the inquiry commenced, citrus-growers pointed out that each year in spring yellow-coloured nymphal bugs of fairly large size were met with, and that the insect was absent from the orangeries during the preceding winter months, and that the problem was to find out where it existed whilst this absence occurred, and to attack it there (if discoverable).

"In the course of our initial investigation we were able to point out a phase in the life history of the orange bug that had been previously overlooked, and to suggest that its apparent absence was to be explained by this fact.

"This phase was one exhibited by the young insect within a week of its hatching from the egg, when it transformed into a thin flat oval-shaped bug, measuring about 7 millimetres in length, coloured as was the under-leaf surface, and occurring singly in this situation dispersed throughout the foliage so as to be practically invisible.

"Mr. Girault, resuming investigations about midwinter, soon discovered that this was exactly what happened—that these peculiar second-stage bugs were present in numbers, and that, although, as had been previously discovered, they clung to their leaf support with some pertinacity, still they could be brought to the ground by concussion of the tree effected by the employment of a wooden mallet.

"Also, that every individual little orange bug brought to the ground sooner or later crawled to the trunk of the tree whence it had fallen, and then commenced to proceed up it to regain the foliage on which it formerly occurred, this observation indicating that it could be disposed of either when on the ground or on its finding its way from it upwards to the branches, when it could be trapped.

"In still later experiments Mr. Girault demonstrated that it happened that a single operation of hammering the tree and its branches might not cause all the insects to detach themselves. He accordingly prosecuted investigations in which different more or less pungent smokes were used, possibly for securing this desired end.

"It was found, however, that when caused to diffuse through the foliage in an unenclosed space their potency was not sufficient to accomplish their downfall. (*Note.*—It is already known that, as in the case of all insects, this may be effected by fumigating with hydrocyanic gas, using a close tent as in scale-insect destruction.)

"That the discovery of this over-wintering stage on the development of the Orange Bug, and of its comportment when in this stage on being brought to the ground, affords a ready means of even capturing the insect in numbers at a time of the year when it was supposed to be absent, will appear from a single result in which this has been availed of.

"In this case the orchardist, Mr. V. G. Pack, of Montville, operating with a padded mallet on a young bug-infested orange tree of about six to seven years of age, used ordinary fly-paper (made with boiled linseed oil, &c.), and forwarded the catch, which on being examined was found to comprise of no less than 3,650 examples of these small flat green young Orange Bugs.

"In the course of further experiments than those alluded to and that have not yet been prosecuted beyond quite initial stages, Mr. Girault being assisted by Mr. J. H. Simmonds, B.Sc., an inquiry has been made into the efficiency of spray fluids in destroying these little insects. Eight different ones, including certain proprietary contact insecticides, have been tested.

"Of these, some have been found to be quite useless; others, such as Black Leaf 40, nicotox and resin plus kerosene emulsion, have proved fatal when brought into contact with the insects by spraying, lime sulphur wash proving also effective but having a slower action.

"In operations, however, on an orangery scale it will be found very difficult to reach individual insects, owing to their habit of living on the under-leaf surfaces and their occuring generally scattered throughout the foliage.

"These investigations are still in progress. Meanwhile allusion may be made to the general situation. I may thus remark that (1) as compared with fruit fly and certain scale insect attack the Orange-tree Bug is a minor citrus pest. Also, that (2)

its subjugation singularly lends itself to co-operative effort, and is, moreover, a proper object for such effort.

"Those whose orangeries are infested by the insect owe this to the fact that their trees have been originally visited by the winged insects from without, an incident that may have befallen every other citrus cultivation in the district that may so far have escaped visitation, and moreover, in pursuing repressive measures, they are not alone ministering to their own interest as growers, but what is more important adopting procedures that must in the end remove a danger that threatens the trees of their neighbours, who otherwise might derive an incursion of bugs from the source that their infested trees supply. In the local Fruitgrowers' Associations acting in unison we have the machinery for effecting this necessary concerted action."

EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JULY, 1923.

The weather conditions during the month were not satisfactory, the cold winds had a bad effect on the fowls. The laying of the heavy breeds improved considerably during the last week. A performance of note was the laying of Mr. W. Becker's Langshans, their score for the month being 140 eggs. Mr. R. Burns follows in the heavy breeds with 131 eggs. In the light breeds, Mr. C. H. Singer heads the list with 136 eggs, Messrs. W. and G. W. Hindes taking the second place with 127 eggs. The following are the individual scores:—

Competitors.	Breed.	July.	Total.
	LIGHT BREEDS.		
*C. H. Singer	White Leghorns ...	136	477
*W. and G. W. Hindes	Do.	135	457
*N. A. Singer	Do.	134	455
*S. L. Grenier	Do.	116	425
*Ancona Poultry Club	Anconas	127	424
*Oakleigh Poultry Farm	White Leghorns ...	125	416
*Rock View Poultry Farm	Do.	115	403
*O. Goos	Do.	111	395
Jas. Hutton	Do.	104	394
*Beckley Poultry Farm	Do.	115	390
F. Sparsholt	Do.	126	387
*J. W. Newton	Do.	101	381
*Mrs. L. Andersen	Do.	124	374
*J. M. Manson	Do.	114	368
*J. W. Short	Do.	112	366
*R. C. J. Turner	Do.	105	357
G. Marks	Do.	103	353
*Bathurst Poultry Farm	Do.	102	352
*H. P. Clarke	Do.	112	348
*Geo. Williams	Do.	107	342
*Arch. Neil	Do.	110	337
G. E. Rogers	Do.	100	337
Jas. Harrington	Do.	94	334
*A. C. G. Wenck	Do.	104	330
*Mrs. R. E. Hodge	Do.	107	327
*C. A. Goos	Do.	114	320
*H. Fraser	Do.	103	314
W. A. and J. Pitkeathly	Do.	100	313
W. Becker	Do.	97	297
C. Quesnell	Do.	103	292
Jas. Earl	Do.	85	291
Chapman and Hill	Do.	100	283
W. and G. W. Hindes	Brown Leghorns ...	102	287
*Mrs. E. White	White Leghorns ...	91	270
*J. Purnell	Do.	119	263
E. Ainscough	Do.	90	258
Parisian Poultry Farm	Do.	101	241
*N. J. Nairn	Do.	111	229

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	July.	Total.
HEAVY BREEDS.			
*W. Becker	Chinese Langshans	140	454
*R. Burns	Black Orpingtons	131	429
*Jas. Potter	Do	130	413
*Jas. Ferguson	Chinese Langshans	121	411
*Jas. Hutton	Black Orpingtons	117	411
*Mrs. A. E. Gallagher	Do.	125	410
J. R. Douglas	Do.	118	399
*E. Walters	Do.	118	383
*H. M. Chaille	Do.	122	376
*E. F. Dennis	Do.	127	375
*Mrs. A. Kent	Do.	120	372
R. Conochie	Do.	101	367
*T. Hindley	Do.	123	346
*R. Holmes	Do.	118	345
*Parisian Poultry Farm	Do.	115	342
W. T. Solman	Do.	105	342
Beckley Poultry Farm	Black Orpingtons	93	336
G. E. Rogers	Do.	115	306
*J. H. Jones	White Wyandottes	96	304
Jas. Ferguson	Plymouth Rocks	101	301
*C. C. Dennis	Black Orpingtons	125	295
Rev. A. McAllister	Do.	100	294
H. B. Stephens	Do.	101	286
W. F. Ruhl	Do.	101	277
W. G. Badcock	Chinese Langshans	85	259
V. J. Rye	Black Orpingtons	100	245
F. J. Murphy	Do	90	167
Jas. Ferguson	Rhode Island Reds	72	163
Mos. Stephens	Black Orpingtons	63	124
Total		7,328	22,734

* Indicates that the birds are being tested singly.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
C. H. Singer	72	105	78	64	70	88	477
W. and G. W. Hindes	67	84	67	64	87	88	457
N. A. Singer	68	83	85	81	67	71	455
S. L. Grenier	64	71	79	71	73	67	425
Ancona Club	66	68	84	60	69	77	424
Oakleigh Poultry Farm	78	74	62	64	77	61	416
Rockview Poultry Farm	73	80	72	69	54	55	403
O. Goos	59	73	73	61	60	69	395
Beckley Poultry Farm	71	56	48	67	73	75	390
J. W. Newton	67	68	60	44	66	76	381
Mrs. L. Andersen	44	68	75	76	55	56	374
J. M. Manson	60	54	76	74	57	47	368
J. W. Short	57	65	56	71	65	42	366
R. C. J. Turner	54	61	59	63	48	72	357
Bathurst Poultry Farm	62	64	53	67	59	47	352
H P. Clarke	70	34	68	52	63	61	348
Geo. Williams	71	71	41	53	55	51	342
Arch Neil	52	48	40	66	75	56	337
A. C. G. Wenck	56	45	56	59	47	67	330
Mrs. R. E. Hodge	46	55	44	66	62	54	327
C. A. Goos	53	72	50	56	43	46	320
H. Fraser	60	42	46	49	56	61	314
Mrs. E. White	39	41	60	49	41	40	270
J. Purnell	48	32	55	31	59	38	263
N. J. Nairn	53	25	49	39	31	32	229

EGG-LAYING COMPETITION—*continued.*

DETAILS OF SINGLE HEN PENS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
W. Becker	76	87	82	73	71	65	454
R. Burns	82	49	66	62	106	64	429
Jas. Potter	52	81	69	67	62	82	413
Jas. Ferguson	74	78	63	65	70	61	411
Jas. Hutton	75	74	79	65	60	58	411
Mrs. A. E. Gallagher	66	78	68	69	64	65	410
E. Walters	80	83	57	55	52	56	383
H. M. Chaille	60	74	71	68	46	57	376
E. F. Dennis	78	59	57	58	70	53	375
Mrs. A. Kent	58	87	58	81	54	34	372
T. Hindley	59	71	70	70	39	37	346
R. Holmes	55	47	56	50	64	73	345
Parisian Poultry Farm	24	52	65	71	67	63	342
J. H. Jones	53	54	59	52	25	61	304
C. C. Dennis	51	60	33	50	49	52	295

CUTHBERT POTTS, Principal.

ZILLMERE EGG-LAYING COMPETITION FOR JULY.

During the month of July the laying in the competition at Zillmere, under the auspices of the National Utility Poultry Breeders' Association, has been very good, particularly in the Black Orpington section, which averaged almost twenty-two eggs per bird. The average for all the birds in the test was 19.77. Altogether 2,610 eggs were laid for the month. There was one case of broodiness noted (No. 93), but the health of the birds left nothing to be desired.

WHITE LEGHORNS.

Pen No.	Owner.	July.	Total.	Pen No.	Owner.	July.	Total.
62	Miss L. M. Dingle ..	26	103	4	T. H. Craig	25	73
75	W. Shaffrey	26	96	43	Kelvin, P. F. ..	23	72
14	Enroh Pens	24	94	38	G. Williams	21	71
15	W. J. Berry	23	92	55	G. Baxter	21	71
8	Oakleigh, P. F. ..	23	89	59	G. Scaletti	23	71
72	W. H. Forsyth ..	23	84	70	R. Shaw	20	71
50	J. Harrington ..	24	83	19	W. Witt	25	70
27	H. T. Britten ..	21	82	20	W. Witt	25	70
65	R. Duff	23	82	84	L. Andersen	23	70
66	R. Duff	21	82	42	W. Wakefield ..	20	69
61	Miss L. M. Dingle ..	22	81	26	E. Stephenson ..	20	68
64	S. Lloyd	21	81	69	R. Shaw	24	67
81	J. E. G. Purnell ..	22	81	29	W. and G. W. Hindes ..	21	66
13	Enroh Pens	19	79	31	H. Needs	22	66
16	W. J. Berry	22	79	71	W. H. Forsyth ..	22	66
18	A. W. Ward	21	78	48	R. D. Chapman ..	8	66
22	M. F. Newberry ..	22	78	1	Carinya P.F.	21	65
33	A. S. Walters ..	22	78	57	H. Fraser	20	65
41	W. Wakefield ..	21	78	45	F. R. Koch	23	64
76	W. Shaffrey	22	78	63	S. Lloyd	22	63
30	W. and G. W. Hindes	22	77	73	A. Hodge	23	63
49	J. Harrington ..	19	77	10	R. C. J. Turner ..	23	62
51	Kidd Bros.	23	76	2	Carinya P.F.	22	61
54	H. Holmes	25	76	37	G. Williams	20	60
7	Oakleigh, P. F. ..	22	75	36	J. T. Webster ..	20	59
28	H. T. Britten ..	23	75	56	G. Baxter	16	59
3	T. H. Craig	19	73	74	A. Hodge	21	59
				11	A. Neil	23	57

ZILLMERE EGG-LAYING COMPETITION FOR JULY—*continued.*

WHITE LEGHORNS—*continued.*

Pen No.	Owner.	July.	Total.
12	A. Neil	23	57
40	J. Earl	3	57
53	H. Holmes	27	57
77	W. Smith	21	56
78	W. Smith	22	55
35	J. T. Webster	16	54
23	Parisian P.Y.	21	52
25	E. Stephenson	13	52
83	L. Andersen	23	50
34	A. S. Walters	19	49
44	Kelvin P.F.	20	47
85	A. Cowley	19	46
6	P. J. Fallon	20	45
17	A. W. Ward	21	45
46	F. R. Koch	14	43
24	Parisian P.Y.	17	42
67	J. and G. Green	13	42
32	H. Needs	6	40
5	P. J. Fallon	5	39
21	M. F. Newberry	23	39
39	J. Earl	9	37
58	H. Fraser	25	36
47	R. D. Chapman	10	29
52	Kidd Bros.	23	23
68	J. and G. Green	9	23
86	A. Cowley	13	21
60	G. Scaletti	15	19
79	W. Bliss	7	18
82	J. E. G. Purnell	17	18
80	W. Bliss	5	16
9	R. C. J. Turner	6	10

BLACK ORPINGTONS.

Pen No.	Owner.	July.	Total.
95	J. Potter	26	109
92	J. Pryde	26	100
112	H. Chaille	24	95
115	C. C. Dennis	26	91
119	J. Harrington	22	89
113	E. Walters	23	86
109	T. Brotherton	29	85
120	J. Harrington	23	85
102	Enroh Pens	19	84
104	L. Pritchard	23	83
96	J. Potter	24	80
89	K. Macfarlane	27	79
107	E. F. Dennis	24	76
101	Enroh Pens	29	73
110	T. H. Brotherton	24	70
111	H. M. Chaille	25	69
117	E. C. Raymond	23	68
105	W. Smith	20	66
93	H. B. Stephens	19	64
116	C. C. Dennis	25	62
118	E. C. Raymond	20	61
87	Parisian P.Y.	25	58
108	E. F. Dennis	20	58
106	W. Smith	18	56
114	E. Walters	23	56
88	Parisian P.Y.	24	54
91	J. Pryde	25	52
94	H. B. Stephens	21	47
99	S. Donovan	7	46
90	K. Macfarlane	22	43
103	L. Pritchard	20	39
98	W. Shaffrey	6	29
100	S. Donovan	19	28
97	W. Shaffrey	4	16

OTHER VARIETIES.

Pen No.	Owner.	July.	Total.
131	W. H. Forsyth (S.W.)	26	94
128	A. S. Walters (B.R.)	24	83
126	J. Ferguson (Lang.)	20	80
125	J. Ferguson (Lang.)	24	68
122	Parisian P.Y. (B.L.)	24	51
123	J. Ferguson (Ancona)	19	40
127	A. S. Walters (B.R.)	14	37
121	Parisian P.Y. (B.L.)	15	24
124	J. Ferguson (Ancona)	17	24
130	R. A. Girling (Min.)	0	22
129	R. A. Girling (Min.)	9	13
132	W. H. Forsyth (S.W.)	0	0
		2,610	8,061

ORANGE WINE.

Mr. W. H. Harvey, of Montville, courteously supplies the following recipe for making orange wine:—

To make 10 *gallons.*—Use a keg of that capacity and squeeze sufficient oranges for 2½ gallons of juice; add 2½ lb. of sugar to the gallon, say 25 lb. to 10 gallons. Keep all pulp in separate tub, add cold water to this and let it remain for twenty-four hours; then strain and add to juice and sugar. Add more water to pulp to the quantity required and let it stand for twenty-four hours. Then strain and fill up keg. Keep the keg filled up with cold water, and, when finished working, bung up airtight and let the wine remain for twelve months. I use small-grade fruit, windfalls, and Sevilles just as they come.

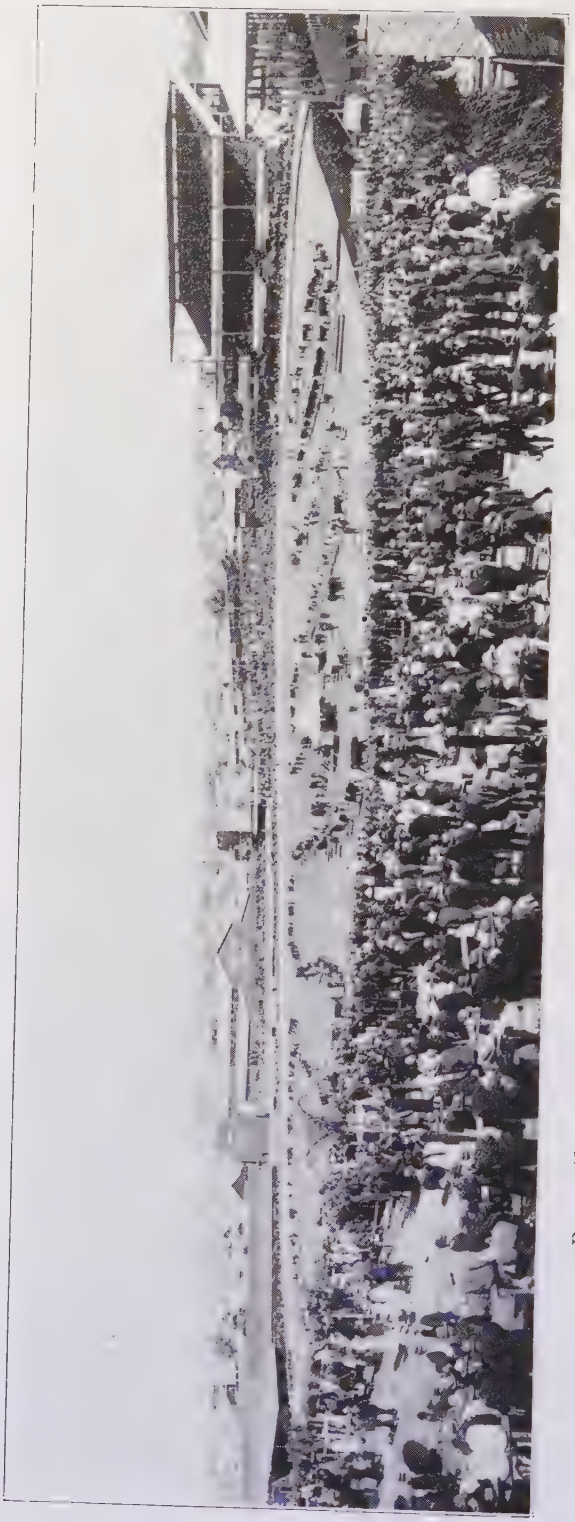


PLATE 41.—THE GRAND PARADE OF STOCK, ROYAL NATIONAL EXHIBITION, BRISBANE, 1923.

ROYAL NATIONAL EXHIBITION.

THE WEALTH OF QUEENSLAND'S BROAD ACRES—A PAGEANT OF PROSPERITY—A REPRESENTATION IN MINIATURE OF THE RURAL RICHNESS OF A FORTUNE-FAVOURED STATE—A TRIUMPH OF ORGANISATION AND ACHIEVEMENT.

The Annual Brisbane Exhibition is rightly regarded as a microcosm of the State—a small-scale representation of the rural industries of a realm. This year's great display, in infinite variety, of the products of the soil was convincing evidence of Queensland's immense agricultural and pastoral capacity, and a striking reflex of the richness of her forests, fields, and pastures.

Possessing a remarkable range of soil and climate, Queensland is probably the most richly endowed State of the Commonwealth, and the great Annual Show in the capital provides a fitting stage for the presentation of her products and the parade of the pick of her flocks and herds. The 48th Annual Show of the Royal National Agricultural and Industrial Association of Queensland, held at Brisbane on 6th to 11th August, was a conspicuous success. On each day attendances were very large, and on the official opening day 75,000 people congregated on the ground. In weather and everything else the Association was well favoured. The district and one-farm exhibits were outstanding features. Other leading pavilion features were the court of the Department of Agriculture and Stock and displays of the products of our staple primary industries, forestry, fruits, and motor vehicles. Queensland's great new industry, cotton-growing, was well illustrated, and the cotton court was a centre of attraction throughout the week. In the arena were paraded stock that would win attention and commendation in any show ring. All the leading dairy breeds were strongly represented, and visitors from other States were most favourably impressed with the quality of the cattle that passed under review. Good horses are an attraction at any Queensland Show, and the stud classes presented for judgment were full of quality. Each day the six fine Clydesdales, purchased by the Government for service in farming districts, were paraded, and the police remounts from the Government Remount Station were equally popular. Generally, this year's exhibition, strong in every feature, was worthy of the State and the great primary industries which the National Association lives to foster.

THE AGRICULTURAL COURT.

REPRESENTATION AND REVIEW OF DEPARTMENTAL ACTIVITIES.

This year's display of the Department of Agriculture and Stock was designed for the express purpose of illustrating the activities of the various branches of the Department. In the arrangement of such a comprehensive assortment of exhibits, their educational value was closely studied.

As Queensland is on the eve of launching a large land settlement scheme in the Upper Burnett and Callide Valley districts, prominence was given in the court to cotton, for this crop is destined to be one of the most favoured for establishing pioneer settlers, and in this Queensland offers a magnificent field for development. Queensland's cotton future is bright. Two hundred and thirty-four thousand pounds sterling was paid to cotton-growers for the crop just ginned under the terms of the Government guarantee; seed cotton produced during the year exceeded 10,500,000 lb. weight.

A notable feature of the cotton exhibit was a display of piece goods manufactured in England from Queensland-grown cotton, a consignment of which only reached Brisbane a few days before.

In the fruit section a special effort was put forth to demonstrate special methods of packing citrus fruit specially graded for the purpose.

Included in a wide range of court exhibits were trophies and displays of sugar-cane, wool, grasses and edible shrubs, and agricultural exhibits of many kinds, including an illustration of the activities of the Pure Seeds and Stock Foods Section. Special exhibits of maize, wheat, stock foods, cotton, and fruits were artistically staged.

The Stock Experiment Station, Yeerongpilly, and the Entomological and Plant Pathological sections of the Department also contributed highly educational evidence of the alliance of Science with Agriculture.

QUEENSLAND'S WEALTH IN WOOL.

Queensland's wealth in wool was well illustrated in the Departmental Court. The exhibit this year was designed as mainly instructional in the direction of

PLATE 42.—HIS EXCELLENCY THE GOVERNOR-GERERAL, LORD FORSTER, OFFICIALLY OPENING THE EXHIBITION.

technical explanations of the various classes. The officers of the Department responsible arranged a set of cards showing the transition of wool from the greasy state right through the various processes up to the manufactured cloth.

A new feature illustrated the term "yield." This term is a technical expression of a leading factor in buying wools, and means the clean scoured product of any sample of wool. The greatest proportion of wool sold in Australia is in the greasy state, and the buyer has to make an estimate on the valuing floor of the clean scoured "yield" of any sample bales placed before him. Six parcels of wool were selected, and half of each was scoured clean and dry. They were placed together and the "yield" shown. This work was done at the Technical Wool School, Brisbane. Appropriate figures were shown on each parcel.

Representative fleeces of high quality were also shown, and gave a good idea of the quality of Queensland wools demonstrated to such advantage during the appraisement era. Next to Tasmania, Queensland wools averaged the highest price per lb.—16.72 pence—while the flat rate for all the Australian wools was 15½d. per lb.

Samples of Corriedale and other long wool breeds were also shown, with cases containing small samples of very high quality. Panels of black and white wools were merely decorative and conveyed no special information.

QUEENSLAND'S RICH NATURAL PASTURES.

Queensland has always had a high reputation for the richness of its natural pastures, and the comprehensive collection of native grasses and forage plants staged by the Department bore testimony that the reputation is well founded. Among the Andropogons are the far-famed Queensland Blue Grass and Satin Top. The former is one of the most palatable and fattening grasses we possess, but is not particularly drought resistant and is easily eaten out with the consequence that many blue grass pastures have deteriorated during recent years as a result of heavy stocking. The genus Astrebla contains the well-known Mitchell Grasses, of which Queensland possesses four distinct kinds, more than any other State. The drought-resistant qualities of these and other grasses of the West are well known, a characteristic being their rapid recovery after rain. Among the Star Grasses, to the same genus of which belongs the imported Rhodes Grass, are several highly esteemed for their

PLATE 43.—THE MINISTER (HON. W. N. GILLIES) IS INTERESTED.

fodder value. The genus Anthistiria contains the well-known Kangaroo Grass and the Tall Oat Grass. Closely allied to these is the Flinders Grass (*Isielema*), one of the most nutritious grasses probably extant and relished by stock when dry as well as green. It is a mass of grain heads, hence, no doubt, its high nutritive value. One of the largest genera of grasses is the genus Panicum, of which quite an array of species were shown. They are mostly of high value and occur in mixed pastures rather than in pure stands. One of the best is the Shot Grass (*Panicum globoideum*), which bears long spikes of shot-like grain, and is therefore exceedingly nutritious. Among other grasses shown were some especially adapted for wet and swampy situations, such as Rice Grass, Swamp Couch, Water Couch, *Panicum obseptum*, and *Panicum proliferum*. Button Grass, Crow's Foot, native paspalums, and sorghums, and other grasses all found a place in this comprehensive array.

PLATE 41. THE "JOURNAL" CORNER—COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

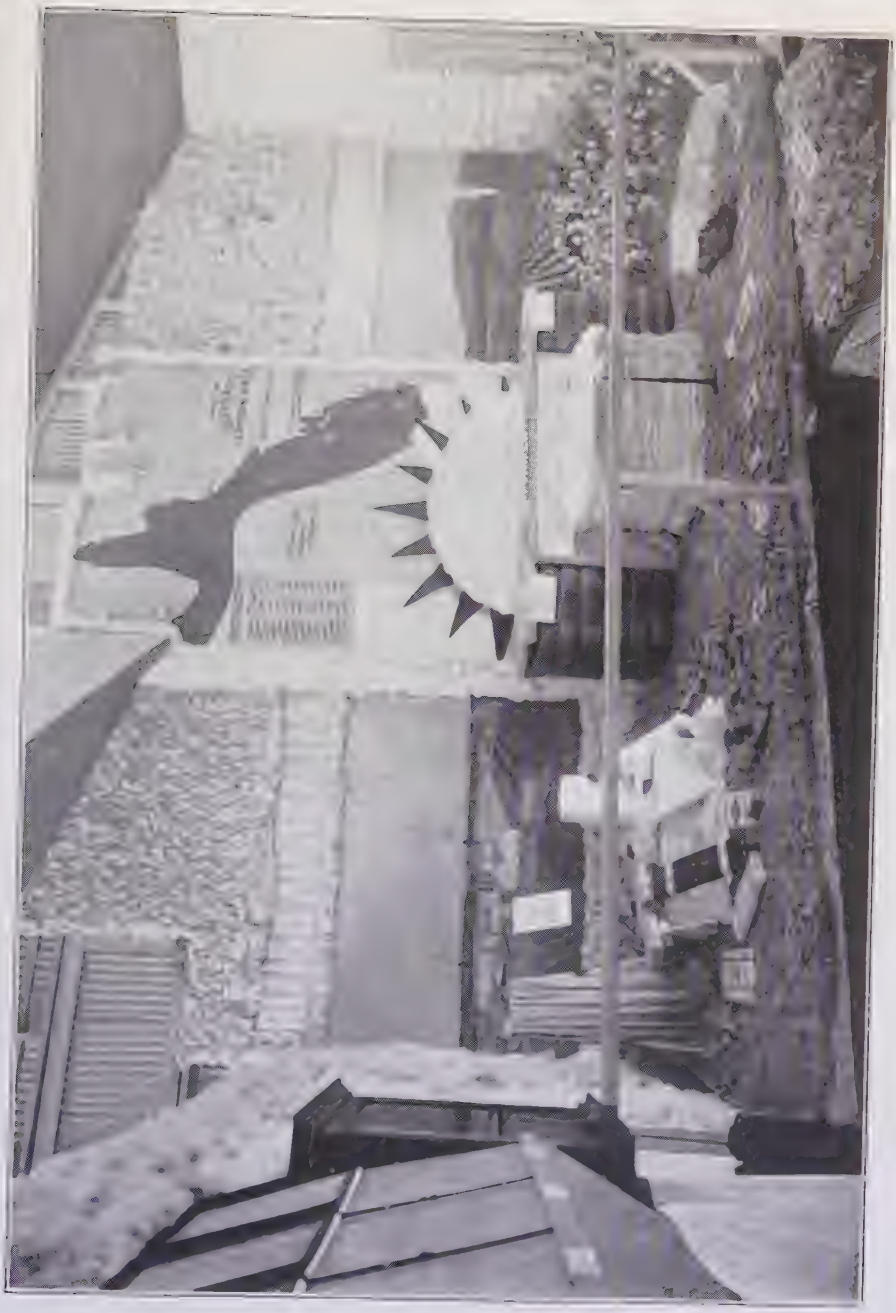


PLATE 45.—A VISION OF QUEENSLAND'S TEXTILE FUTURE.
Exhibit of The Australian Cotton Growers' Association, Royal National Exhibition, Brisbane, 1923.

EDIBLE TREES AND SHRUBS.

Among the more remarkable and valuable features of Australian vegetation is the number of trees and shrubs, particularly in our open western country, that may be used as food for stock. The collections shown of about thirty sorts proved interesting and instructive to pastoralists, stockowners, and farmers generally. Among the many varieties displayed were the Mulga, Kurrajong, Apple Tree, Wild Orange or Bumbil, Beelah, Emu Bush, Whitewood, Myall, Cattle Bush, Red Ash, and Broad-leaved Sally. All these and others have helped to keep cattle alive and in good condition during long spells of dry weather. The propagation, conservation, and utilisation of these valuable trees is a matter of national importance. The Botanical Division of the Department is always willing to report on any samples of plants sent for identification and information by farmers, pastoralists, or others interested.

THE SUGAR INDUSTRY.

DISPLAY BY THE BUREAU OF SUGAR EXPERIMENT STATIONS.

A number of new varieties of cane grown at the Bundaberg Sugar Experiment Station were staged in the Agricultural Court. These comprised canes from Mauritius, Fiji, Barbadoes, Demerara, and New Guinea. Other varieties shown were raised in Queensland. Full descriptions of these appeared upon the cards attached to the canes, which also gave their commercial cane sugar content. Many of these canes are at present undergoing chemical and field tests, while others have passed the probationary period and are being distributed to canegrowers. These latter varieties, however, comprise only a fraction of the number of new and tested canes distributed from the Sugar Experiment Station in the course of the past twenty years. Prior distributions included such well-known canes as Badila and the Gorus, which are very largely grown in North Queensland. One of the principal objects of the Experiment Station is the constant introduction of new varieties and their commercial testing. Before any cane varieties are allowed to leave the Experiment Station they have to pass chemical and commercial trials through plant, first ratoon, and second ratoon crops. Each variety is tested not less than four times in the course of the sugar season, so that records are obtained giving farmers and millowners information as to whether canes are early or late, and as to whether their sugar contents are sufficiently high to warrant their adoption. This is combined with agricultural trials in the field, so that it may be determined whether such varieties are good croppers. They are further keenly watched for evidence of disease, and no affected canes are allowed to go into distribution. When varieties have passed these trials they are carefully examined and packed before being sent to growers living at a distance from the station. Farmers close at hand are permitted to visit the station and remove varieties selected for distribution. All canes are distributed free to canegrowers. The worthless varieties are discarded. Information of this kind could only otherwise be secured by growers and millers at the cost of much time and money, and the rejection of many useless canes by the mills, which would be accompanied by severe loss to the growers.

Sugar-cane Propagation.

In addition to the work recorded, the Experiment Station at Innisfail has now commenced work in the direction of raising cane from seed, and so far over 300 seedlings have been propagated.

Study of Soils, Cultivation, and Fertilising.

Work at the Experiment Stations also comprises the study of soils, cultivation, and fertilising. It is sought to introduce improved methods of cultivation, liming, fertilising, rotation of crops, and conservation of moisture, and growers are taught the principles of cultivation and business methods by visits to the Experiment Stations, and by lectures and addresses delivered in the various sugar districts, and by the issue of bulletins. It may be claimed that this work has been highly successful. The Sugar Experiment Stations analyse soils free for canegrowers, and give advice by personal interviews or by letter on the requirements of the soil in the way of application of lime where necessary, green manuring and fertilisers, and the treatment of the land by proper soil handling. Upwards of 1,000 cane soils have so far been

analysed. Cane samples are also tested free of charge, so that growers may know the best time in which to cut their cane. Field officers move around amongst farmers, giving advice on cultural operations.

Investigation and Research Work.

Investigation and research work in connection with the sugar-cane's most serious pest—viz., the grub, is now being carried out by the Bureau of Sugar Experiment Stations in a systematic manner, and numerous bulletins have been issued upon the subject. The entomological laboratories are situated at Meringa, near Cairns, which is the centre of the worst grub-infested region in North Queensland. A chemical fumigant called para-dichlorbenzene has been successfully used during the past twelve months in the destruction of cane grubs.

Economic Value of Cane Cultivation—Its National Significance.

The work of the Sugar Experiment Station, in relation to its promotion of the agricultural welfare of Queensland in connection with the sugar industry, cannot be over-estimated. When it is considered that this industry is the greatest agricultural one in Queensland, and will produce a yield of 240,000 tons of sugar this year, estimated to be of the value of £6,500,000, it can be seen how highly necessary it is that it should be assisted and encouraged in every possible way. Apart from its economic value, however, it has a deep national significance, and has already played a very large part in peopling the North. According to the recent census, the increase in population in the last ten years in the Herbert Electoral Division was 19.4 per cent., or 14,929 persons—a greater increase numerically than in any other part of the Commonwealth.

THE SUGAR BELT.

Apropos of the sugar industry, it is to be noted, on reference to a map of the State, that the land in Queensland used for sugar-growing is included in a long, narrow, coastal belt. Parts of this belt are separated from each other by considerable tracts of non-sugar country. The latter, owing to a deficient rainfall or poorness of soil, are not utilised for cane. This belt is included between latitudes 16 deg. and 28 deg. south, and the bulk of the staple is grown within the tropics.

The bulk of the sugar soils can be stated to be from good to rich alluvial, such as river flats, with deep red volcanic soils of considerable depth. The nature of the country is generally designated "scrub" and "forest." The North Queensland scrubs are really jungles, carrying a thick growth of what is known as scrub timber, such as silky oak, bean, pender, kauri, silkwood, Johnstone River hardwood, interlaced with lawyer vine and other creeping plants, while the stinging tree is also conspicuous. Forest country usually consists of ironbark, bloodwood, Moreton Bay ash, blue gum, poplar gum, and acacia.

Rainfall.

The Queensland rainfall, fortunately, is highest during the summer period, at which time the cane plant makes its maximum of growth. The following are average rainfalls in the principal sugar-growing districts:—Cairns, 92.65; Johnstone River, 160.88; Herbert River, 84.91; Mackay, 66.67; Bundaberg, 44.40. Cane grows best when the relative humidity of the atmosphere is high, and this is the case during the wet season in Northern Queensland.

Queensland's sugar production in 1867 was 338 tons, and in 1917 307,000 tons.

The Greatest Agricultural Industry in the State—White Labour Production.

Australia is the only place in the world where cane sugar is produced by white labour. We are in competition with countries which produce sugar by black labour and under black-labour conditions. In Java, wages are only about 1s. per day, the worker keeping himself. Without protection through the tariff, or regulation of the price by the Government, it would be quite impossible for the Australian industry to survive.

About £15,000,000 are invested in the Queensland sugar industry. It is the greatest agricultural industry in the State. No other branch of agriculture in Australia employs so much manual labour.

PLATE 46.—QUEENSLAND'S NEW INDUSTRY ILLUSTRATED—COTTON AND ITS PRODUCTS, CENTRAL TROPHY,

Plate 47.—The Produce of One Well-Worked Farm at Teviotville.
Mr. K. Haag's Winning Display.

PLATE 48. ARRAY OF QUEENSLAND CANES, DEPARTMENTAL COURT.

PLATE 49.—QUEENSLAND'S MARCH FROM A WHEAT IMPORTING TO AN EXPORTING STATE.
The Wheat Breeding Work of the Department of Agriculture and Stock illustrated in the Departmental Court.

PLATE 50.—QUEENSLAND'S GREAT WOOL INDUSTRY—DEPARTMENTAL DISPLAY OF TYPES AND CLASSES.

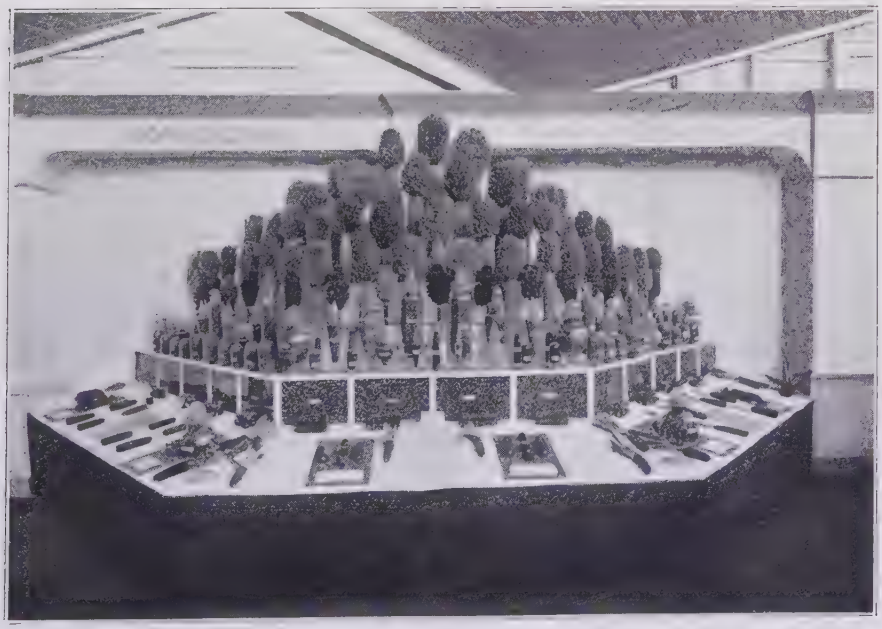


PLATE 51.—THE GRAIN TROPHY, DEPARTMENTAL COURT.

WHEAT.

The display of wheat this year emphasised the Departmental activities in the direction of the improvement of this important cereal. With the view of introducing to growers the improved qualities of wheats which have been raised at the Roma wheat-breeding farm, and demonstrating their qualities when grown under similar conditions to other varieties in general cultivation, propagation plots were established at the State farms and throughout the main wheat-growing districts. It is generally conceded that many of the varieties of wheats commonly grown can be improved upon in many ways, and that an improved standard would enhance the State's reputation as a wheat-growing country. Advantage has been taken of the organisation existing in the Department to carry on a comprehensive scheme for testing the varieties thoroughly before introducing them into cultivation. Provision also has been made for distributing seed wheat from the resultant crops to growers, and using the surplus for extending the cultivation of any particular variety which has proved superior to varieties now in cultivation.

MAIZE.

A practical illustration was placed before the public in the maize exhibit in the Agriculture Court of what the Department is doing in respect to the improvement in the type and yield of Queensland-grown maize. Work of this character has been carried out for a number of years, and at the same time to determine the suitability or otherwise of the several varieties to various districts. "Ear to row" tests and propagation plots are established each season in isolated areas, where there is no risk of cross-fertilisation taking place. Selections are made from these for further propagation work, and also for seed for distribution to farmers. Fresh varieties are being continually tried out, and only those that prove to be high-yielding varieties are kept. Included in this display were the following varieties, which have been grown for a number of years and have proved to be high-yielding strains.

Tested and Proved Varieties.

Improved Yellow Dent is a five to five and a-half months' variety, suitable for scrub lands and coastal districts, particularly on alluvial soils and where there is a good rainfall. This is a proved heavy yielder, having returned, under field conditions, over 100 bushels to the acre.

Golden Beauty is a medium late variety, taking from four and a-half to five months to mature, a heavy yielder, also a good fodder corn. A very hardy variety, and has a very high shelling percentage.

Star Leaming is a medium early variety, about four months, and one of the best of the early varieties. Very suitable for early or catch crops, and where there is a short growing season. Ears are very heavy and compact.

Reid's Yellow Dent is a four months' variety and a splendid yielder. This is also a suitable maize for districts where there is a short growing season, and is an excellent fodder corn. This season a plot of this variety yielded 96 bushels per acre from 4 acres.

Funk's Yellow Dent is another four months' variety, also a good yielder. Ears are weighty and very tightly packed. Like Reid's, it is suited for early crops, or districts which have a short growing season; also a good fodder corn.

Funk's 90 Day was imported two years ago by the Department, with the idea of securing a high yielding type to meet an insistent demand for a quick maturing variety. Excellent results have been obtained. The variety has proved to be a good yielder and an ideal variety for the purpose for which it was imported. It can also be recommended as a good fodder corn.

COTTON.

A very fine educational exhibit of cotton was arranged. It included instructive texts on the culture of the shrub and the picking of cotton. Open bolls were shown to illustrate the proper and improper stages at which seed cotton should be picked, and sets of standards representing the grades of the seed cotton as it has been picked this year were on view. Varieties of cotton were arranged to show the size of boll and length of lint. Explanatory and descriptive matter relating to the merits and value of the lint of these varieties was also set out. There were also exhibits illustrating the length of staple of various cottons, and samples of cotton in the various forms from seed cotton to the manufactured product. Cotton seed and the by-products of cotton seed, dress goods manufactured from Queensland cotton, and literature and photographs relating to cotton-growing in Queensland were included in the display.

QUEENSLAND FRUITS.

It is some years since the Fruit Branch of the Department put up a fruit exhibit as a contribution to the Departmental display. This year, however, a very interesting and instructive exhibit was arranged. This comprised a number of cases of fruit, chiefly citrus, displayed to illustrate correct methods of grading and packing fruit in the new citrus case. Various packs were displayed, showing how the first, second, third, fourth, and last layers are packed, each layer being packed by itself in a single tray, gradually working up to the finished case.

Each pack depended entirely upon the size and grading of the fruit, and the latter was done with a variation of $\frac{1}{4}$ in., 2 in., $2\frac{1}{4}$ in., $2\frac{1}{2}$ in., $2\frac{3}{4}$ in., 3 in., $3\frac{1}{4}$ in. It is laid down that a 2-in. orange or other fruit is a 2-in. one until the $2\frac{1}{4}$-in. size is reached, after which it becomes the $2\frac{1}{4}$-in. size. By this simple calculation no grower may go wrong with grading and packing his fruit, but the importance of grading cannot be too strongly stressed if good packing is to result. Each case shown was explanatorily labelled.

On the pack now being taught by officers of the Department the number of fruits is marked upon the case so that the buyer may know exactly how many he is purchasing.

To citrus and other growers the display was a valuable object-lesson.

ENTOMOLOGY.

The Entomological Section of the Department of Agriculture prepared a display of insects of general economic importance. The life history and damage of each of these were fully illustrated in twenty-seven excellently set-up cases, the work of Messrs. E. and H. Jarvis, under the direction of Mr. H. Tryon, entomologist in chief.

Cotton.

On account of the bright prospects of the cotton industry, the insects which affect this crop are perhaps the most interesting to the general public. In the cases containing these were shown the more important pests with which our cotton-growers may

PLATE 52.—THE ENTOMOLOGICAL EXHIBIT, DEPARTMENTAL COURT.

PLATE 53.—MORETON, THE WINNING DISTRICT EXHIBIT, "A" GRADE, ROYAL NATIONAL EXHIBITION, BRISBANE, 1923.

PLATE 54.—THE KINGAROY EXHIBIT, ROYAL NATIONAL EXHIBITION, BRISBANE, 1923.

PLATE 55.—THE WEALTH OF QUEENSLAND'S WOODS—OBJECT LESSONS IN ECONOMICAL FORESTRY.

Display of the State Forest Service, Royal National Exhibition, Brisbane, 1923.

PLATE 56.—QUEENSLAND'S RICH NATURAL PASTURES. THE DEPARTMENTAL DISPLAY.

have to contend. Firstly, there were the small moths, the larvæ of which attack the young branchlets and immature bolls—namely, the Rough Boll Worm and the Spotted Boll Worm. Then the "cotton worm," which damages the young squares, causing these to die and fall off, and the pale green leaf-eating caterpillar of "Cosmophila," the "Harlequin Bug," and the two cotton stainers completed a very enlightening exhibit.

Fruit.

Of scarcely less interest was a comprehensive display of the Queensland fruit fly (dacus Tryoni). Paintings and actual specimens of each stage of the life cycle of this most serious pest were shown. The case was completed by very fine representations of the injury the insect inflicts on such a large number of our fruits. Citrus-injuring moths, butterflies, and the peculiar scale insects affecting the same family of trees were also shown.

Vegetables.

Other cases contained specimens of insects which may be seen in every vegetable garden in the State, and which are thus of both general interest and great economic importance. The various moths of cabbage, potato-damaging beetle, and the pea and bean weevils, and characteristic damage due to each were shown very strikingly.

Cereals.

The damages due to insects which affect the cereal crops and stored grain were also demonstrated.

The Banana Beetle Borer.

The ravages of the banana beetle borer have created a big problem facing the banana industry. It is when the beetle is in the grub stage that it does the damage. Boring through the bulb it destroys the power of the plant to store sufficient food to give the best development of the plants and to yield the best fruit. The attack may be so severe that no bunch at all is produced. In order to check the increase of the beetle, too much care cannot be devoted to keeping the plantation as free as possible from the old butts and stems in which the beetle breeds in considerable numbers. Trapping by means of pieces of banana corm or stem for "baits" will get rid of a large proportion of the pest when this is carried out thoroughly and systematically.

In a corner of the court four stages in the life cycle (egg, grub, pupa, and adult beetle) of this pest were shown. Portions of the banana plants demonstrating the damage caused by the grubs and the appearance of the infested parts were shown, and these exhibits gave some idea of what to look for when examining for beetle borer.

Infested corms, or stems, when cut open, show the circular holes more or less tightly packed with waste plant material left by the grubs, and which will generally be found when these tunnels are followed up. The grubs are legless, with a white body and head of reddish brown. When full grown they are a little more than half an inch long. Beetles may also be present. When mature they are black, a little less than half an inch in length, with a curved trunk in front. The investigations being made by Mr. John L. Froggatt, B.Sc., of the Entomological staff, into the life history, habits, &c., of this pest have yielded much information, and have given results on control measures, under laboratory conditions, that have indicated lines along which successful methods of control, not previously followed, may be obtained.

THE STOCK DISEASES EXPERIMENT STATION.

The exhibit of the Stock Diseases Experiment Station at Yeerongpilly was both interesting and instructive to the stock raiser and the dairy farmer. In order to demonstrate the efficiency of the treatment of tick-infested cattle with standard

arsenical solution, a particular case is cited from recent investigations conducted at Yeerongpilly:—

Two cows were each infested with 600,000 young ticks. One of these animals, thirteen days later, was sprayed with the dipping fluid, the result being that only one tick survived, and this tick did not entirely escape the effect of the arsenic, for it only laid a very small number of eggs, nine of which hatched, but all the young ticks died within a few days. From the untreated cow, 3,764 fully engorged ticks were removed.

Any stockowner may free his property from the tick pest by dipping his cattle every fourteen days in a standard arsenical solution. By so doing his cows will increase in value and give more milk, while the markets for his surplus stock will be unrestricted.

Tuberculosis.

A series of permanently mounted specimens demonstrating the many manifestations of this disease were displayed, including tubercular lesions found in the ox, pig, domestic cat, and other animals. Of special interest was a tubercular udder from a dairy cow, and the tail of a bullock showing tubercular lesions as a result of inoculation with contaminated Pleuro virus. Tuberculin (the diagnostic agent for this disease) prepared at the Laboratory, Yeerongpilly, was also featured, together with brief information dealing with preventive measures.

Contagious Abortion.

This disease is known to exist among dairy stock in some localities in Queensland, and may be readily diagnosed by means of the agglutination test. This test is carried out at the Laboratory. Cultures of the germ associated with this disease were shown growing artificially on Agar Agar in partial vacuum.

There was also a display of Laboratory products, including Blackleg vaccine, Pleuro virus, Tuberculin for diagnosing tubercular disease in animals, and special vaccine for the prevention and treatment of different infectious diseases of animals.

The staff at Yeerongpilly will be pleased to furnish full information on personal or written application pertaining to this exhibit and kindred subjects.

PURE SEEDS AND STOCK FOODS.

The exhibit of the Seeds and Stock Foods Investigation Branch comprised a small collection of agricultural and vegetable seeds, also ninety of the weed seeds commonly occurring in seeds and stock foods. Farmers would do well to make themselves acquainted with such poisonous seeds as *Datura stramonium* (Thorn Apple) and *Ricinus communis* (Castor Oil Beans), and the suspected poisonous *Stachys arvensis* (Stagger weed), *Lolium temulentum* (Darnel), as well as with the following:—*Brassica sinapistrum* (Charlock), *Lepidium ruderale* (waste-places Cress), *Melilotus parviflora* (Hexham Scent), *Raphanus raphanistrum* (Wild Radish), *Sisymbrium orientale* (Oriental Rocket), and *Tagetes glandulifera* (Stinking Rodger), all of which impart a bad flavour to butter.

Better Seeds, Better Crops.

Seeds constitute the most variable material that the farmer or merchant purchases, and the success or failure of a crop or even succeeding crops may be wholly determined by the condition of the seed sown. No one can afford to leave any doubtful point to chance, and it is but common prudence to ascertain the purity and germination of all seeds before sowing or offering them for sale. These matters can only be decided by a scientific examination of a large and truly representative sample drawn from the actual bulk in the sender's possession. No charge is made to farmers in respect of samples of any seeds purchased by them for their own sowing, provided full particulars as to quantity purchased and the seller's name and address are forwarded with the sample.

The best is the cheapest whatever the price, and quality should be the one and only consideration that determines a purchase.

PLATE 57.—THE CAMPAIGN AGAINST STOCK DISEASES AND PESTS.
Activities of the Queensland Government Stock Institute Illustrated, Departmental Court.

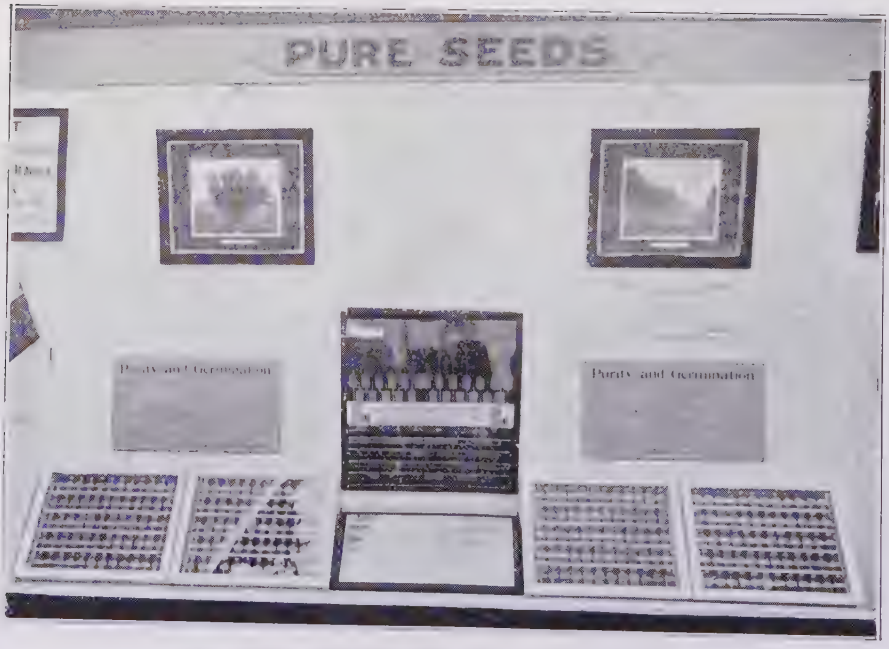


PLATE 58.—PROTECTING THE FARMERS' INTERESTS.
Activities of a little-known, but very effective section of the Department of Agriculture and Stock Illustrated, Departmental Court.

POLICE REMOUNTS.

An innovation in this year's ring programme was the introduction of an event for Police Remount horses, which were judged for style, action, and conformation. Thirteen members of the mounted force in the metropolitan area entered for the event. All the men were in dress uniform, and they made a most impressive appearance as they paraded in front of the judge. The horses were well groomed, and the accoutrements were in perfect order to the last button; the judge, Mr. Gidney, had no easy task in picking the three placed horses. They were all in the pink of condition, and, as the judge said afterwards, they looked quite good enough to compete in open hack company at any show. The horses were bred at the Government Remount Station at Rewa, near Springsure, and the manner in which they were shown and handled was certainly a credit to the Queensland Police Department. Mr. Gidney awarded the blue ribbon and first prize of £5 to Benedict, a very handsome brown

PLATE 59.—THE UNDER SECRETARY FOR AGRICULTURE AND STOCK, MR. ERNEST G. E. SCRIVEN (CENTRAL FIGURE) AND FRIENDS.

gelding by Lord Elderslie. The red ribbon and second prize of £3 went to Anchor, a bay gelding by Bonny Boy. The third prize of £2 was awarded to Merrut, a brown gelding by Libertine.

In commenting on the horses shown in this event, Mr. Gidney said it would be difficult to find in any part of Australia a group of horses of more equal quality. The first and second were good enough to win in any open company in any part of Australasia. All the horses were bred true to type, and it was a surprise to him to know that any Department could breed them so successfully. The winner was a rich brown, showing any amount of breeding and quality. The second also showed great quality, but was not so well educated as the first. In points, the third was not far behind, but youth favoured the first and second. The judge said he was more than pleased with the display, which, in his opinion, added considerably to the general excellence of the ring exhibits in the hack classes

The winner was ridden by Constable D. A. Prince, the second by Constable D. Doyle, and the third by Constable M. P. Hogan.

YOUNG JUDGES.

KEEN COMPETITION.

A most interesting feature of the stock section on 8th August was the Young Judges' Competition. The young entrants carried out their work in the midst of a crowd of stockbreeders and other interested persons. Thirty candidates faced the judge (Mr. D. C. Pryce), and were asked to judge the Clydesdale stallions, the Hereford beef cattle, the Illawarra milking shorthorns, Ayrshires, the Fresians, and the Berkshire swine. In all these classes they demonstrated their ability quite satisfactorily. Fourteen entered for the judging of the Illawarra milking shorthorn cow, and thirteen of them carried out their work. After a very keen competition, Mr. Pryce gave his decision in favour of Mr. Arthur Middleton (Wyreema), whose father is well known everywhere for his Illawarra cattle. The young winner was only five points behind the judge in this class. Mr. George Middleton, the winner's brother, was only a point behind him, and the third prize went to Mr. J. S. Anderson, of Southbrook.

In the Ayrshire cow competition, out of seven competitors, Mr. J. S. Handley (Murphy's Creek) was only one point behind the judge, and Messrs. O. W. Spresser (Brassall) and J. A. Anderson (Southbrook) both filled the same totals.

Mr. Arthur J Brown (Toogoolawah) gained first position in the judging of the Friesians, with Mr. E. Cochrane a close second.

The judge expressed great pleasure at the results of the competition as a whole, and commented especially on the closeness of the various candidates' points to his own. Details:—

Dairy Cattle, I.M.S.: A. Middleton, 1; G. Middleton, 2; J. S. Anderson, 3.

Ayrshires: J. S. Handley, 1; J. S. Anderson and O. W. Spresser (equal), 2.

Friesians: A. J. Brown, 1; E. Cochrane, 2.

Clydesdale Horses: C. R. Logan and O. W. Spresser equal.

Hereford Beef Cattle: O. W. Spresser.

Swine (Berkshires): C. T. Warburton, 1; H. F. Whitaker, 2.

PLATE 60.—THE SUN GOLD OF SUN LAND—A SAMPLE OF QUEENSLAND'S CITRUS PACK, DEPARTMENTAL COURT.

THE AWARDS.

DISTRICT EXHIBITS.

In the primary products and manufactures, in A grade, West Moreton again had a meritorious win with an aggregate grand total of 1,161½ points, as against Wide Bay and Burnett's grand total of 1,054 points. It is noteworthy that West Moreton's grand total in 1922 was 1,213 points, so that the exhibit has gone back as regards the aggregate this year. On the other hand, Wide Bay and Burnett's aggregate in 1922 was 816, while this year they have secured a grand total of 1,054, a very big improvement. In comparing the tabulated points it will be noticed that West Moreton led in the following sections:—Dairy produce, foods, grain, manufactures and trades, wines, &c., tobacco, hay, chaff, &c., wool, &c., enlarged photos, &c., and effective arrangement; while Wide Bay and Burnett had the best exhibits in fruit, vegetables, &c., minerals and building materials, and tropical products. Wide Bay and Burnett secured possible points for honey and by-products, rum, spirits and by-products, while West Moreton gained possible points for tobacco and enlarged photos, &c. The detailed points are as follows:—

PRIMARY PRODUCTS AND MANUFACTURES.

PRIZE MONEY UP TO £600.—CHAIRMAN'S TROPHY.

In addition to the prize money, a handsome trophy, value £15, was presented by Mr. Ernest Baynes, Chairman of Council, to the district scoring the highest points.

CHELMSFORD SHIELD.

	Possible Points.	West Moreton.	Wide Bay and Burnett.
(1) DAIRY PRODUCE—			
Butter, 1 box, 56 lb.	90	83	87
Milk, condensed, concentrated, or dried, and by-products	40	38	10
Cheese, not less than 1 cwt.	60	50	55
Eggs, suitable for domestic use, 1 doz. of each variety	20	20	13
	210	186	165
(2) FOODS—			
Hams and bacon	50	44	43
Boiled and smoked beef and mutton	20	9	10
Small goods and sausages, if smoked or preserved	10	9	7
Fish, smoked, preserved, and canned	10	4	8
Canned meats	25	20	0
Lard, tallow, and animal oils	20	13	16
All butchers' by-products, not included in any other part of scale of points	10	9	8
Honey and its by-products	20	14	20
Confectionery, factory-made	10	6	4
Bread, biscuits, scones, and cakes, factory-made	10	7	3
	185	135	119

CHELMSFORD SHIELD—*continued.*

	Possible Points.	West Moreton.	Wide Bay and Burnett.
(3) FRUITS, VEGETABLES, AND ROOTS—FRESH AND PRESERVED—			
Fresh fruits, all kinds	60	42	51
Preserved fruit, jams, &c.	30	28	20
Dried fruits	20	12	15
Fresh vegetables, all kinds, including table pumpkins, but excluding potatoes	25	22	20
Preserved and dried vegetables, pickles, sauces, &c.	10	6	9
Potatoes, English and sweet	40	34	35
Roots, all kinds, and their products, arrowroot, cassava, meal, &c., samples not less than 1 lb.	14	10	4
Cocoanuts, peanuts, and other nuts	6	3	5
	205	157	159
(4) GRAIN, &c.—			
Wheat	50	38	16
Flour, bran, pollard, macaroni, and meals prepared therefrom	10	1	9
Maize	50	42	26
Maizena, meals, starch, glucose, and cornflours	10	2	2
Oats, rye, rice, barley, malt, pearl barley, and their meals	30	20	22
	150	103	75
(5) MANUFACTURERS AND TRADES—			
All woodwork	30	24	27
All metal and ironwork	30	24	26
Leather and all leather-work and tanning	20	15½	14
Manufactured woollen and cotton fibre	30	25	..
All tinwork	10	8	8
Artificial manures	10	9	4
Brooms and brushes	10	6	3
Manufactures not otherwise enumerated	15	14	12
	155	125½	94
(6) MINERALS AND BUILDING MATERIALS—			
Gold, silver, copper, and precious stones	25	12	14
Coal, iron, other minerals, and salt	30	17	24
Stone, bricks, cement, marble, terracotta	20	16	14
Woods—Dressed, undressed, and polished, one face to be dressed and half of it polished, back to be rough, samples of wood to measure not less than 12 x 6 x 1 inch thick	25	21	20
	100	66	72

CHELMSFORD SHIELD—*continued.*

	Possible Points.	West Moreton.	Wide Bay and Burnett.
(7) TROPICAL PRODUCTS—			
Sugarcane	60	25	50
Sugar (raw and refined)	20	2	18
Rum, spirits, and by-products	10	3	10
Coffee (raw and manufactured), tea, and spices	10	3	8
Cotton (raw) and by-products	30	20	18
Rubber	10	..	..
Oils (vegetable)	10	8	0
	150	61	104
(8) WINES, &C.—			
Wines	15	15	6
Aerated and mineral spa water, vinegar, and cordials	10	8	9
	25	23	15
(9) TOBACCO—			
Tobacco, cigar and pipe, in leaf	20	20	..
(10) HAY, CHAFF, &C.—			
Oaten, wheaten, lucerne, and other hay	30	24	18
Grasses and their seeds	10	8	6
Oaten, wheaten, lucerne, and other chaffs	50	42	30
Ensilage and other prepared cattle fodder	20	16	10
Sorghums and millets, in stalk	10	6	6
Commercial fibres (raw and manufactured)	10	7	6
Pumpkins and other green fodder	10	9	4
Broom millet, ready for manufacture	10	4	9
Farm seeds, including canary seed	13	7	10
	163	123	99
(11) WOOL, &C.—			
Scoured wool	40	34	36
Greasy wool	60	56	48
Mohair	10	7	8
	110	97	92
(12) ENLARGED PHOTOGRAPHS—			
A maximum of 5 points will be awarded for enlarged photographs of district scenery and local raised live stock	5	5	3
(13) EFFECTIVE ARRANGEMENT—			
Comprehensiveness of view	30	27	20
Arrangement of sectional stands	20	18	14
Effective ticketing	10	7	9
General finish	20	18	14
	80	70	57
Grand Total	1,558	1,161½	1,054

PRIMARY PRODUCTS.

As there was only one entry in this section—Kingaroy—the only comparison that can be made is with that district's last year's figures. This year the exhibit was awarded a grand total of 782 points, while in 1922 the grand aggregate was 767. According to the judges, the exhibit this year compared with last year as follows, the figures being (the latter in parentheses):—Dairy produce, 151 (148); foods, 70 (61); fruit, vegetables, &c., 95 (94); grain, &c., 97 (94); woods, 32 (32); hides, &c., 9 (4); tropical products, 26 (33); minerals, 26 (24); tobacco, 12 (5); hay, chaff, &c., 99 (101); wool, &c., 86 (97); photos, &c., 2 (2); ladies' work, 27 (36); effective arrangements, 51 (36); grand totals, 782 (767). Details:—

PRIMARY PRODUCTS ONLY.

PRIZE MONEY, UP TO £400.

	Possible Points.	Kingaroy.
(1) DAIRY PRODUCE—		
Butter, 1 box, 56 lb.	90	88
Cheese, not less than 1 cwt.	60	55
Eggs, suitable for domestic use, 1 doz. of each variety	20	8
	170	151
(2) FOODS—		
Hams, bacon (rolled and smoked), beef, and mutton	50	35
Fish—smoked	10	0
Lard, tallow, and animal oils	15	9
Honey and its by-products	25	10
Confectionery (home-made)	10	8
Biscuits, bread, cakes, and scones (home-made)	10	8
	120	70
(3) FRUITS, VEGETABLES, AND ROOTS—FRESH AND PRESERVED—		
Fresh fruits—all kinds	60	20
Preserved fruit and jams, &c., prepared by farmer	20	16
Dried fruit, prepared by farmer	5	5
Fresh vegetables, all kinds, including table pumpkin, but excluding potatoes	25	7
Preserved and dried vegetables, pickles, sauces, &c.	10	7
Potatoes, English and sweet	40	20
Roots, all kinds, and their product, arrowroot, cassava, meal, &c., samples not less than 1 lb.	10	4
Cocoanuts, peanuts, and other nuts	10	7
Vegetable seeds	10	9
	190	95
(4) GRAIN, &C.—		
Wheat	50	30
Flour, bran, pollard, macaroni, and meals prepared therefrom	10	2
Maize	50	40
Maizena, meals, starch, glucose, and cornflour	10	4
Oats, rye, rice, barley, malt, pearl barley, and their meals	30	21
	150	97
(5) WOODS—		
Woods—Dressed, undressed, and polished, one face to be dressed and half of it polished, back to be rough. Samples to measure not less than 12 x 6 x 1 inch thick	25	20
Wattle bark	15	12
	40	32

PRIMARY PRODUCTS ONLY—*continued.*

	Possible Points.	Kingaroy.
(6) HIDES (1) AND HOME PRESERVED SKINS, FOR DOMESTIC USE—		
Must be free from offensive smell	15	9
(7) TROPICAL PRODUCTS—		
Sugar cane	60	3
Coffee, tea, spices	10	3
Cotton (raw) and by-products	30	20
	100	26
(8) MINERALS—		
Gold, silver, copper, and precious stones	25	10
Coal, iron, and other minerals, and salt	30	15
	55	25
(9) TOBACCO—		
Tobacco (cigar and pipe) in leaf	20	12
(10) HAY, CHAFF, &C.—		
Lucerne, oaten, wheaten, and other hay	30	20
Grasses and their seeds	7	6
Oaten, wheaten, lucerne, and other chaffs	50	25
Ensilage and other prepared cattle fodder	20	8
Sorghums and millets	10	8
Commercial fibres	10	3
Pumpkins and other green fodder	10	6
Hemp and flax	10	4
Broom millet, ready for manufacture	10	8
Farm seeds, including canary seed	13	11
	170	99
(11) WOOL, &C.—		
Scoured wool	40	34
Greasy wool	60	45
Mohair	10	7
	110	86
(12) ENLARGED PHOTOGRAPHS—		
A maximum of 5 points will be awarded for enlarged photographs of district scenery and local bred live stock	5	2
(13) LADIES' WORK—		
Needlework, knitting	25	12
School needlework	5	4
Fine arts	5	4
School work, maps, writing, &c., for pupils of schools in the district	10	7
	45	27
(14) EFFECTIVE ARRANGEMENT—		
Effective ticketing	10	4
Comprehensiveness of view	30	23
Arrangement of sectional stands	20	14
General finish	20	10
	80	51
Total	1,270	782

ONE-FARM COMPETITION.

The awards in the one-farm exhibits gave Mr. K. Haag a grand total of 438½ points, compared to his opponent's (Mr. A. Lofgren's) 351½ points, and thus for the second year in succession Mr. Haag is the winner of this interesting competition. Both exhibits were particularly creditable. Details:—

COLLECTION OF FARM PRODUCE, FOODS FOR CONSUMPTION, ETC.

	Possible Points.	K. Haag.	A. Lofgren.
(1) DAIRY PRODUCE—			
Butter, 6 lb.	25	23	22
Cheese, 1 large or 2 small, home-made	20	19	7
Eggs, suitable for domestic use, 1 doz. each variety	5	3	4
	50	45	33
(2) FOODS—			
Hams (15 lb.), bacon (15 lb.), home-cured	20	15	13
Corned, smoked, and spiced beef and mutton (10 lb.)	10	7	8
Honey, 12 lb.	10	8	10
Beeswax, 6 lb.	5	4	5
Bread (2 loaves), scones (1 doz.)	5	3½	2½
Confectionery and sweets, 3 lb.	5	4	3
Cakes and biscuits	5	4	2
Lard, tallow, oils	5	4	3
	65	49½	46½
(3) FRUITS, VEGETABLES, AND ROOTS—FRESH AND PRESERVED—			
Fresh fruits, all kinds	25	9	15
Dried fruits	10	10	4
Preserved fruits and jams	15	15	8
Fresh vegetables	15	10	12
Pickles, sauces, &c.	15	15	12
Potatoes, not less than 28 lb. (or a collection) and roots	25	20	18
Table pumpkin, squashes, and marrows, 56 lb.	10	8	6
Cocoanuts and nuts	3	2	1
Vegetable and garden seeds	5	4	3
Arrowroot, 10 lb.	5	3	3
Sugar, beet, 3 lb.	5	2	3
Cassava, 3 lb.	5	..	..
Ginger, 3 lb.	5	..	..
	143	98	80
(4) GRAIN, &C.—			
Wheat	25	20	6
Maize	20	17	11
Barley, oats, rye, and rice	20	15	12
	65	52	29
(5) TROPICAL PRODUCTS—			
Sugar-cane, 24 stalks or 1 stool	30	12	24
Cotton in seed, 10 lb., long staple	10	6	8
Coffee, 10 lb.	5	0	5
	45	18	37

ONE-FARM COMPETITION—*continued.*

	Possible Points.	K. Haag.	A. Lofgren.
(6) TOBACCO—			
Tobacco, leaf, dried, 5 lb.	10	..	..
(7) HAY AND CHAFF, &C.—			
Hay, oaten, wheaten, lucerne, and other varieties	20	15	8
Grasses and their seeds, including canary	10	9	7
Chaff, oaten, wheaten, lucerne, and other varieties	20	15	12
Ensilage, any form	15	6	6
Cattle fodder (pumpkins and green fodder)	15	14	14
Sorghums and millets	10	9	6
Hemp, 5 lb.	5	2	0
Flax, 5 lb.	5	2	0
Cow pea seed, 7 lb.	7	5	3
Broom millet, 10 lb.	10	9	..
	117	86	56
(8) WOOL—			
Greasy, 5 fleeces	20	15	14
Mohair	5	4	0
	25	19	14
(9) DRINKS, &C.—			
Temperance drinks, 6 bottles	10	8	6
(10) WOMEN'S AND CHILDREN'S WORK—			
Needlework, knitting	10	7	7
Fine arts	5	2	2
Fancy work	15	10	10
School work, maps, writing, &c.	5	..	..
School needlework	5	..	..
	40	19	19
(11) MISCELLANEOUS ARTICLES OF COMMERCIAL VALUE	5	4	2
(12) PLANTS AND FLOWERS IN POTS	5	4	1
(13) TIME AND LABOUR-SAVING USEFUL ARTICLES MADE ON THE FARM	10	6	2
(14) EFFECTIVE ARRANGEMENT OF EXHIBIT—			
Comprehensiveness of view	10	8	8
Arrangement of stands	5	5	4
Effective ticketing	10	9	7
General finish	10	8	7
	35	30	26
Total	625	438½	351½

FARM PRODUCE.

(Judges: Agricultural products, Messrs. H. Quodling, C. McKeon, C. Clydesdale (Department of Agriculture); cotton, Mr. D. Jones.

Maize (shelled).—Large yellow: Hawkesbury Champion or Goldsbury King—W. F. Elliott 1, H. Dipple 2; Improved Yellow Dent, J. and F. Stenzel 1 and 2; Yellow Dent—C. W. Lubach 1, E. Pickering 2.

Small yellow: Early Leaming, J. and F. Stenzel; Reid's Funks or James's Yellow Dent, J. and F. Stenzel.

So-called Ninety Days: Small Yellow Dent—W. Dearling; Small Yellow Flint, J. and F. Stenzel.

Other varieties: Large White—W. Neal, junr.; Red Hogan—J. and F. Stenzel; Red Butcher or other distinct red type not eligible in other red classes—J. and F. Stenzel 1 and 2; Small Early Red—C. S. Huxley 1, T. Fisher 2, J. and F. Stenzel 3; sweet corn, other varieties, 10 lb.—No first, H. Dipple 2; popcorn, any variety, 10 lb.—H. Dipple 1, J. Donges 2. Champion prize for best exhibit shown—W. Elliott. Association's certificate—C. W. Lubach.

Maize ears.—Large yellow: T. Fisher. Large white: W. Neal, junr. Any other white variety: H. Dipple. Popcorn: J. Donges.

Wheat.—Medium strong flour, one bag: O. L. Heutschel 1, C. S. Huxley 2. Grand champion prize, best exhibit of wheat: O. L. Hentschel 1, R. Wiedon 2, W. Dearling, 3.

Barley.—Malting barley, 1 bushel, Chevalier or Battledore type: No first, H. Obst 2. Sea of Azov type: H. Obst 1 and 2. Cape barley: J. D. Berney. Skinless barley: C. S. Huxley 1, J. Campbell 2.

Oats.—Algerian or Sunrise: J. D. Berney.

Hay.—Lucerne hay, best dry, green, coloured: J. H. Boatfield. Oaten hay: C. S. Huxley. Straw, any kind: C. S. Huxley. Oaten hay, Algerian, suitable for chaffing: H. W. Berlin 1, T. Fisher 2. Oaten hay, Tartarian, for chaffing purposes: H. W. Berlin 1 and 2. Wheaten hay, for chaffing: H. W. Berlin 1, C. S. Huxley 2.

Chaff.—Lucerne chaff, cut from dry, green, coloured hay: J. E. Stanton 1, J. H. Boatfield 2. Cut from prime sweated hay: J. Campbell 1, W. Dearling 2. Oaten chaff, screened and bright, cut from prime hay: W. H. Berlin 1, C. S. Huxley 2. Wheaten chaff, screened, bright, cut from prime hay: H. W. Berlin 1, J. Donges 2. Mixed chaff, oaten and lucerne: H. W. Berlin 1, C. S. Huxley 2. Wheaten and lucerne: H. W. Berlin 1, C. S. Huxley 2. Panicum and lucerne: H. W. Berlin 1, J. Campbell 2. Any other variety: J. Campbell. Millet or panicum chaff, any kind, cut from prime hay: J. Campbell 1, K. Haag 2. Grass hay chaff, cut from artificial and native grasses: H. W. Berlin. Wheaten straw chaff: C. S. Huxley 1, W. Dearling 2. Straw chaff, any other kind: J. Campbell 1, W. Dearling 2.

Sorghums and millets.—Saccaline: H. W. Berlin. Painters' Friend: H. W. Berlin 1, H. Dipple 2. Amber cane. H. Dipple. Soudan grass: C. S. Huxley. Panicum and fodder millet, Liberty millet: C. S. Huxley 1, H. W. Berlin, 2. Japanese millet: H. W. Berlin 1, C. S. Huxley 2. White panicum: H. W. Berlin.

Pasture grass seeds.—Prairie grass: C. S. Huxley 1, H. W. Berlin 2. Lucerne seed: C. S. Huxley.

Flax and hemp.—Dressed flax: W. Dearling.

Beans and peas.—Cow peas, black: W. Dearling. Clay-coloured: C. S. Huxley. Black-eyed Susan: C. S. Huxley.

Miscellaneous.—Giant Russian sunflower: J. Donges. Canary seed of commerce: K. Haag 1 and 2. Linseed: W. Dearling.

Sugar-cane.—Collection of good milling varieties: B. French and Son. Five sticks, D.1135: B. French and Son. Five sticks, 1900 seedling: B. French and Son.

Potatoes.—Blue varieties: Guyra Blue, Coronation, or Commonwealth—L. Ebert 1, C. W. Lubach 2. Manhattan—L. Ebert. Brownell varieties, any variety other than Satisfaction—A. Loweke 1, T. Fisher 2. Satisfaction—A. Loweke 1, L. Ebert 2. White varieties: Carmen—A. Loweke 1, J. F. Dietz 2. Manistee—C. Seiler 1. Scottish Triumph—A. Loweke. Up-to-date—C. W. Lubach.

Champion blue potato exhibit: L. Ebert. Champion Brownell: A. Loweke. Champion white: A. Loweke.

Pumpkins.—Crown: J. Campbell 1 and 2. Cattle pumpkins, judged by weight: C. W. Lubach. Bugle: J. and F. Stenzel. Piemelons: J. Steeleither. Mangold wurzel, long, red: H. W. Berlin. Swedes, purple top: J. Steeleither.

EXPORT BUTTER.

THIRTY DAYS' STORAGE.

One box butter (salted), most suitable for export, to be stored thirty clear days:—

——	Flavour.	Texture.	Colour.	Salting.	Finish.	Total.
Queensland Farmers' Co-operative Co., Ltd., Boonah	60	20	7	4	4	95
Nanango Co-operative Dairy Co., Ltd.	60½	19½	7	4	3½	94½
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	59½	20	7	4	3½	94
Queensland Farmers' Co-operative Co., Ltd., Grantham	58	20	7	4	4	93
Queensland Farmers' Co-operative Co., Ltd., Booval	58	19½	7	4	4	92½
Queensland Farmers' Co-operative Co., Ltd., Laidley	58½	19½	7	3½	4	92½
Esk Co-operative Dairy Co., Ltd.	58	19½	6½	4	4	92
Wide Bay Co-operative Dairy Co., Ltd., Gympie	58	19½	7	4	3½	92
Stanley River Co-operative Co., Ltd.	57	20	7	4	3½	91½
Warwick Butter and Dairy Co., Ltd., Mill Hill	57	19½	7	4	4	91½
Caboolture Co-operative Co., Ltd., Pomona	57	19½	6½	4	4	91
Logan and Albert Co-operative Dairy Co., Ltd.	58	19½	6	4	3½	91
Maryborough Co-operative Dairy Co., Ltd., Biggenden	58	19	6	4	4	91
South Burnett Co-operative Dairy Co., Ltd.	58	19	6½	4	3½	91
Warwick Butter and Dairy Co., Ltd., Allora	56	19½	7	4	4	90½
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	57	19½	6½	4	3½	90½
Caboolture Co-operative Co., Ltd., Caboolture	56	19½	6½	4	4	90
Maleny Co-operative Dairy Co., Ltd.	57	19½	6	4	3½	90
Caboolture Co-operative Co., Ltd., Eumundi	56	19½	6	4	4	89½
Terror's Creek and Samsonvale Co-operative Society, Ltd.	55	19	6½	4	3½	88
Gayndah Co-operative Dairy Co., Ltd.	53	19½	7	4	3½	87

EIGHT WEEKS' STORAGE.

One box (unsalted), most suitable for export, to be stored eight weeks:—

——	Flavour.	Texture.	Colour.	Packing and Finish.	In place of Salt	Total
Queensland Farmers' Co-operative Co., Ltd., Grantham	60	20	7	4	4	95
Wide Bay Co-operative Dairy Co., Ltd., Gympie	59½	19½	7	4	4	94
Queensland Farmers' Co-operative Co., Ltd., Laidley	59	19½	7	4	4	93½
Logan and Albert Co-operative Dairy Co., Ltd.	58½	19½	7	4	4	93
Esk Co-operative Dairy Co., Ltd.	58	19½	7	4	4	92½
Caboolture Co-operative Co., Ltd., Caboolture	57	20	7	4	4	92
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	58	19½	7	3½	4	92
Queensland Farmers' Co-operative Co., Ltd., Boonah	57½	19½	7	4	4	92

EXPORT BUTTER—*continued.*

ONE BOX EIGHT WEEKS' STORAGE (UNSALTED)—*continued.*

—	Flavour.	Texture.	Colour	Packing and Finish.	In place of Salt.	Total.
Queensland Farmers' Co-operative Co., Ltd., Booval	57½	19½	7	4	4	92
Terror's Creek and Samsonvale Co-operative Society, Ltd.	58	19½	7	3½	4	92
Warwick Butter and Dairy Co., Ltd., Millhill	57	19½	7	4	4	91½
Nanango Co-operative Dairy Co., Ltd.	58½	19	6½	3½	4	91½
Maryborough Co-operative Dairy Co., Ltd., Biggenden	57	19½	7	4	4	91½
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	57	19½	7	3½	4	91
Caboolture Co-operative Co., Ltd., Eumundi	56	19½	7	4	4	90½
Gayndah Co-operative Dairy Co., Ltd.	57	19½	6	4	4	90½
Warwick Butter and Dairy Co., Ltd., Allora	57	19	7	3½	4	90½
Caboolture Co-operative Co., Ltd., Pomona	57	19½	5½	4	4	90
Stanley River Co-operative Co., Ltd.	56	19½	7	3½	4	90
Maleny Co-operative Dairy Co., Ltd.	54	19	7	3	4	87

One box butter (salted), suitable for export, to be kept in cold stores for not less than eight weeks:—

—	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Queensland Farmers' Co-operative Co., Ltd., Grantham	60	20	7	4	4	95
Queensland Farmers' Co-operative Co., Ltd., Boonah	59	20	7	4	4	94
Nanango Co-operative Dairy Co., Ltd.	59½	19½	6½	4	3½	92½
Queensland Farmers' Co-operative Co., Ltd., Laidley	58½	19½	7	4	4	92
Caboolture Co-operative Co., Ltd., Caboolture	57	19½	7	4	4	91½
Esk Co-operative Dairy Co., Ltd.	57½	19½	6½	4	4	91½
Logan and Albert Co-operative Dairy Co., Ltd.	57	19½	7	4	4	91½
Maryborough Co-operative Dairy Co., Ltd., Biggenden	57½	19½	7	4	3½	91½
Queensland Farmers' Co-operative Co., Ltd., Booval	58	19½	6½	3½	4	91½
Warwick Butter and Dairy Co., Ltd., Allora	57	19½	7	3½	4	91
Warwick Butter and Dairy Co., Ltd., Millhill	57	19½	7	3½	4	91
Maleny Co-operative Dairy Co., Ltd.	57	19½	6½	4	4	91
Wide Bay Co-operative Dairy Co., Ltd., Gympie	57	19½	7	3½	4	91
South Burnett Co-operative Dairy Co., Ltd.	57	19½	6½	4	3½	90½
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	57	19½	6	3½	4	90
Stanley River Co-operative Dairy Co., Ltd.	56½	19½	7	3½	3½	90
Caboolture Co-operative Co., Ltd., Eumundi	55	19½	7	4	4	89½
Gayndah Co-operative Dairy Co., Ltd.	56	19½	6½	3½	4	89½
Terror's Creek and Samsonvale Co-operative Society, Ltd.	55	19	6½	4	3½	88
Maleny Co-operative Dairy Co., Ltd.	53	19	6½	4	3½	86

BUTTER AWARDS.

Box butter (salted), most suitable for consumers' trade in Britain. The butter to be manufactured from pasteurised cream and to be cold stored eight weeks:—

—	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Queensland Farmers' Co-operative Co., Ltd., Boonah	60	20	7	4	4	95
Queensland Farmers' Co-operative Co., Ltd., Grantham	59½	20	7	4	4	94½
Queensland Farmers' Co-operative Co., Ltd., Laidley	58½	20	7	3½	4	93
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	58	20	7	4	3½	92½
Queensland Farmers' Co-operative Co., Ltd., Booval	58	19½	7	4	4	92½
Esk Co-operative Dairy Co., Ltd.	57	19½	7	4	4	91½
Maryborough Co-operative Dairy Co., Ltd., Biggenden	57½	19½	6½	4	4	91½
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	58	19½	6½	4	3½	91½
Nanango Co-operative Dairy Co., Ltd.	58	19½	6½	4	3½	91½
Caboolture Co-operative Co., Ltd., Caboolture	57	19½	6½	4	4	91
Caboolture Co-operative Co., Ltd., Pomona	57	19½	6½	4	4	91
Logan and Albert Co-operative Dairy Co., Ltd.	57	19½	6½	4	4	91
Warwick Butter and Dairy Co., Ltd., Allora	57	19	7	3½	4	90½
Warwick Butter and Dairy Co., Ltd., Millhill	57	19	7	3½	4	90½
Wide Bay Co-operative Dairy Co., Ltd., Gympie	55	19½	7	4	4	89½
Caboolture Co-operative Co., Ltd., Eumundi	55	19½	6½	4	4	89
Terror's Creek and Samsonvale Co-operative Society, Ltd.	55	19	6	4	3½	88½
Gayndah Co-operative Dairy Co., Ltd.	55	19½	6	4	3½	88
Maleny Co-operative Dairy Co., Ltd.	54	19	6	4	3½	86½

FRESH BUTTER.

ONE BOX FRESH FACTORY-MADE BUTTER FOR LOCAL CONSUMPTION.

—	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Maryborough Co-operative Dairy Co., Kingaroy	60	20	7	4	4	95
Queensland Farmers' Co-operative Co., Ltd., Booval	59½	20	7	4	4	94½
Nanango Co-operative Dairy Co., Ltd.	59½	19½	7	4	3½	93½
Wide Bay Co-operative Dairy Co., Ltd., Gympie	58	20	7	4	4	93
Esk Co-operative Dairy Co., Ltd.	58	20	7	4	4	93
Queensland Farmers' Co-operative Dairy Co., Ltd., Boonah	58	20	7	4	4	93

FRESH BUTTER—*continued.*

ONE BOX FRESH FACTORY-MADE BUTTER FOR LOCAL CONSUMPTION—*continued.*

—	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Queensland Farmers' Co-operative Co., Ltd., Grantham	58	20	7	4	4	93
Queensland Farmers' Co-operative Co., Ltd., Laidley	58	20	7	4	4	93
Caboolture Co-operative Co., Ltd., Caboolture	58	19½	7	4	4	92½
Caboolture Co-operative Co., Ltd., Pomona	58	19½	7	4	4	92½
Maleny Co-operative Dairy Co., Ltd.	58½	19½	7	4	3½	92½
Logan and Albert Co-operative Dairy Co., Ltd.	57	19½	7	4	3½	91
South Burnett Co-operative Dairy Co., Ltd.	57	19½	6½	6½	4	91
Caboolture Co-operative Co., Ltd., Eumundi	56	19½	7	4	4	90½
Gayndah Co-operative Dairy Co., Ltd.	57	19½	6½	4	3½	90½
Maryborough Co-operative Dairy Co., Ltd., Biggenden	57	19	6	4	4	90
Warwick Butter and Dairy Co., Ltd., Allora	56	19½	7	4	3½	90
Terror's Creek and Samsonvale Co-operative Society, Ltd.	56	19½	7	4	3½	90
Warwick Butter and Dairy Co., Ltd., Millhill	55	19½	7	4	4	89½
Stanley River Co-operative Co., Ltd.	55	19½	7	4	3½	89
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	56	19	6	4	3½	88½

AGGREGATE NUMBER OF POINTS SECURED FOR ALL CLASSES OF BUTTER.

—	Thirty Days' Storage (Salted).	Eight Weeks' Storage (Unsalted).	Eight Weeks' Storage (Salted).	Eight Weeks' (Salted), Pasteurised.	One Box Fresh Butter.	Grand Total.
Queensland Farmers' Co-operative Dairy Co., Ltd., Grantham	93	95	95	93½	93	469½
Queensland Farmers' Co-operative Dairy Co., Ltd., Booval	92½	92	91½	92½	94½	463
Queensland Farmers' Co-operative Dairy Co., Ltd., Laidley	92½	93½	92	93	93	464
Maryborough Co-operative Co., Ltd., Kingaroy	94	91	91½	92½	95	464
Nanango Co-operative Dairy Co.	94½	91½	92½	91½	93½	463½
Queensland Farmers' Co-operative Dairy Co., Ltd., Boonah	95	92	94	95	93	469

CHEESE.

Two export cheeses, 70-80 lb. (to be not more than three weeks old prior to storing), white, suitable for English market:—

—	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
(1) Pittsworth Dairy Co., Ltd., No. 2 Factory ..	45	25	15	10	95
(2) Pittsworth Dairy Co., Ltd., No. 1 Factory ..	43½	25	15	10	93½
(3) Gayndah Dairy Co., Ltd., Byrnestown ..	44½	24	15	8½	92
Woodleigh Cheese Factory	41½	24½	14½	9½	90

Two export cheeses, 70-80 lb. (to be not more than three weeks old prior to storing), coloured, suitable for English market:—

—	Flavour.	Texture.	Colour.	Finish.	Total.
(1) Woodleigh Cheese Factory	44½	24½	14½	9½	93
(2) Mount Tyson Farmers' Co-operative Dairy Co., Ltd...	44	25	15	8½	92½
(3) Pittsworth Dairy Co., Ltd., No. 1 Factory ..	43	24½	14½	10	92
Gayndah Co-operative Dairy Co., Ltd., Byrnestown	43	25	14	8½	90½

COTTON GROWING.

—	Desirability of Type, 20.	Fruitfulness, 20.	Uniformity of Length of Fibre, 15.	Uniformity of Strength of Fibre, 15.	Storm-proof Qualities, 10.	Degree of Opening of the Bolls, 10.	Earliness, 10.	Total, 100.
TWO PLANTS—								
F. Coglan	18	16	12	12	6	8	5	77

—	Weight of Bolls, 20.	Uniformity of Length of Fibre, 20.	Uniformity of Strength of Fibre, 20	Drag of Lint of Bolls, 20.	Drag of Lint, 10.	Character of Lint, 10.	Total, 100.
MATURED OPEN BOLLS OF SEED COTTON—							
E. G. Clarke	20	16	18	15	8	8	85
F. Coglan	18	15	18	12	8	8	79

—	Size of Lock, 20.	Uniformity of Length of Fibre, 20.	Uniformity of Strength of Fibre, 20.	Drag of Lint, 15.	Character of Lint, 15.	Cleanliness, 10.	Total, 100.
SEED COTTON, 10 LB.—							
A. S. Bailey	13	16	15	12	15	10	81
A. S. Bailey	13	18	18	10	15	10	84
J. Logan	14	16	15	12	15	10	82

BEEF CATTLE.

Herefords (judge, R. Reynolds).—Bull, 4 years and over: J. Sparkes's Mangel Banner Prince 1, J. T. Turnor's Holmwood Baron 2. Bull, 3 and under 4 years: Archer Bros.' Ltd. Fanfare II. 1, J. Sparkes's Lyndley Monarch I. 2, E. C. McConnel's Cressbrook Merry Boy 3. Bull, 2 and under 3 years: Wilson and McDowall's Eton Victory 1, E. G. McConnel's Cressbrook Premier 2, J. Sparkes's Admiration 3. Bull, 18 months and under 2 years: C. H. Tindal's Ramornie Fearless 1, Tindall and Son's Gunyan Lad 2, J. Sparkes's Lyndley Ringer 3, Tindall and Son's Gunyan Grandee highly commended. Bull, 12 and under 18 months: Archer Bros. Ltd. Dreamer V. 1, J. Sparkes's Lyndley Hilsman 2, J. Sparkes's Lyndley Statesman 3. Bull calf, 6 months and under 12: Archer Bros. Ltd. Premier 1, J. Sparkes's Lyndley Ambassador 2, J. Sparkes's Lyndley Plum 3. Pair bulls, 12 months and under 3 years, special prize: Tindall and Son's Gunyan Grandee and Gunyan Lad. Group of three bulls, 12 months and under 3 years: J. Sparkes. Cow, 4 years and over: J. H. S. Barnes's Miss Bettie 2nd 1, J. Sparkes's Jessie Lyndley 2. Cow, 3 and under 4 years: J. Sparkes's Jessie Lyndley 15th. Cow or heifer, 2 and under 3 years: J. H. S. Barnes's Canning Chance 1, J. Sparkes's Lyndley Minerva 18th 2. Heifer, 18 months and under 2 years: J. Sparkes's Lyndley Baroness 1, J. H. S. Barnes's Flower Queen 2, J. H. S. Barnes's Last Night 3. Heifer, 12 and under 18 months: J. Sparkes's Madge Lyndley 2nd 1, Archer Bros. Ltd. Alto 9th 2. Heifer calf, 6 and under 12 months: J. Sparkes's Lyndley Beauty 2nd 1, E. C. McConnel's Cressbrook Saucy 4th 2. Pair of heifers, 12 months and under 2 years: J. Sparkes 1, J. H. S. Barnes 2. Group, three heifers, 12 months and under 3 years: J. H. S. Barnes 1, J. Sparkes 2. Breeders' group, two males and three females: J. Sparkes. Exhibitors' group, two males and three females: J. Sparkes. Sires' progeny stakes group: J. H. S. Barnes 1, J. Sparkes 2, Archer Bros. 3.

Champion Hereford Bull: Wilson and McDowall's Eaton Victory.

Reserve Champion Hereford Bull: J. Sparkes's Mansel Banner Prince.

Junior Champion Hereford Bull: Archer Bros. Ltd. Dreamer 5th.

Champion Hereford Cow: J. H. S. Barnes's Ness Beattie 2nd.

Reserve Champion Hereford Cow: J. H. S. Barnes's Canning Chance.

Shorthorns (judge, W. R. Scott).—Bull, 4 years and over: J. Burgess's Adcote Butterfly Beau 1, O. C. Slade's Aladdin 2. Bull, 3 years and under 4 years: Late C. E. McDougall's Estate's Lyndhurst Royal Peer 27th. Bull, 2 years and under 3 years: Late C. E. McDougall's Estate's Lyndhurst Royal Peer 35th 1, Whitney Pastoral Co.'s Coombing Duke of Widgiewa I. 2, Mrs. I. Whitney's Coombing Duke of Derrimut 19th 3. Bull, 18 months and under 2 years: J. Burgess's Lord Donnington 1, H. Pownall's Fairy Knight IV. 2, J. Burgess's Count Ringmaster 3. Bull, 12 and under 18 months: J. S. Shonemann's Kuyura Duke of Derrimut 14th 1, A. E. Slade's Warspite III. 2, A. E. Slade's Warspite V. 3. Bull calf, 6 months and under 12 months: Wilson and McDowall's Calliope Count Goldie 39th 1, Late C. E. McDougall's Estate's Lyndhurst Royal Peer 36th 2, Late C. E. McDougall's Estate's Lyndhurst Royal Peer 27th 3. Group of three bulls: J. Burgess 1, Cain Bros. 2. Cow, 4 years and over: Late C. E. McDougall's Estate's Lyndhurst Royal Rose 1, J. T. Scrymgeour's Boquhan Clara III. 2, late C. E. McDougall's Estate's Lyndhurst Princess Imperial II. 3. Cow, 3 and under 4 years: Late C. E. McDougall's Estate's Lyndhurst Duchess of Ettrick 1, late C. E. McDougall's Estate's Lyndhurst Duchess of York II. 2, J. Burgess's Fairy Peeress 3. Cow, with calf at foot: Late C. E. McDougall's Estate's Lyndhurst Royal Rose 1, J. T. Scrymgeour's Boquhan Clara III. 2, J. Burgess's Golden Bessie VII. 3. Cow and 2 or more of her progeny: Late C. E. McDougall's Estate's Lyndhurst Royal Rose 1, late C. E. McDougall's Estate's Lyndhurst Princess Imperial 2nd 2. Cow or heifer, 2 and under 3 years: Late C. E. McDougall's Estate's Lyndhurst Royal Rose 11th 1, Cain Bros.' Madowla's Bouvardine 2. Heifer, 18 months and under 2 years: Cain Bros., Madowla's Laurel 47th 1, J. Burgess's Oxford Countess 2, late C. E. McDougall's Estate's Lyndhurst Lady of Gurley 3. Heifer, 12 and under 18 months: Wilson and McDowall's Harlequin of Calliope 1, Wilson and McDowall's Secret Second of Calliope 2, Wilson

and McDowall's Cerasia of Calliope 3. Heifer calf, 6 and under 12 months: Late C. E. McDougall's Estate's Lyndhurst Lady of Beverley 20th 1, J. S. Thonemann's Kuyura Princess 4th 2, J. Burgess's Golden Butterfly 2nd 3, J. T. Scrymgeour's Netherby Red Rose highly commended. Three heifers, 12 months and under 3 years: Wilson and McDowall. Sire and 3 of his progeny, 12 months and over: J. Burgess's Adcot Butterfly Beau. Breeders' group: Late C. E. McDougall's Estate 1, J. Burgess 2. Exhibitors group: Late C. E. McDougall's Estate 1, J. Burgess 2. Sires' progeny stakes group: Wilson and McDowall 1, J. Burgess 2, late C. E. McDougall's Estate 3.

Champion Shorthorn Bull: J. Burgess's Adcote Butterfly Beau.

Reserve Champion Shornhorn Bull: O. C. Slade's Aladdin

Champion Shornhorn Cow: Late C. E. McDougall's Estate's Lyndhurst Duchess of Ettrick.

Reserve Champion Shorthorn Cow: Late C. E. McDougall's Estate's Lyndhurst Royal Rose.

Red Polled (judge, Mr. D. Gunn).—Bull, 3 years and over: E. J. McConnel's Royal Farmer. Bull, under 3 years: E. J. McConnel's Marshlands Royal Laurel 1, E. J. McConnel's Marshlands Royal Mac 2.

Champion Red Polled Bull: E. J. McConnel's Royal Farmer.

Reserve Champion Red Polled Bull: E. J. McConnel's Marshlands Royal Laurel.

Devons (judge, D. Gunn).—Bull, 3 years and over: R. A. Howell's Forester's Gold Dust. Bull, 2 and under 3 years: R. A. Howell's Field Marshal 47th. Bull, 1 and under 2 years: R. A. Howell's Just Perfection. Bull calf, 6 months and under 12: R. A. Howell's Field Marshal 80th 1, R. A. Howell's Field Marshal 81st 2. Heifer, 1 and under 2 years: R. A. Howell's Countessa 65th. Heifer calf, 6 and under 12 months: R. A. Howell's Countessa 78th.

Champion Devon Bull: R. A. Howell's Forester's Gold Dust.

Champion Devon Cow: R. A. Howell's Countessa 65th.

South Devons.—Bull: Nestlé—Anglo-Swiss Condensed Milk Co.'s (Australasia), Ltd., Hussar of Nestlés. Cow or heifer: Nestlé and Anglo-Swiss Condensed Milk Co.'s (Australasia), Ltd., Pansy 2nd.

Champion South Devon Cow: Nestlé and Anglo-Swiss Co.'s (Australasia), Ltd., Pansy 2nd.

Aberdeen Angus.—Bull, 3 years and over: D. W. McLeod's The Laird of Glen Aloon 1, G. C. Clarke's Tom Thumb 2. Bull, 2 and under 3 years: G. C. Clarke's Black Jupiter. Cow, 3 years and over: G. C. Clarke's Scotswoman. Heifer, 1 year and under 2: G. C. Clarke's Raffia 1, G. C. Clarke's Scottish Peeress 2.

Champion Aberdeen Angus Bull: D. W. McLeod's The Laird of Glen Aloon.

Champion Aberdeen Angus Cow: G. C. Clarke's Scotswoman.

Reserve Champion Aberdeen Angus Bull: G. C. Clarke's Black Jupiter.

Fat Cattle (judge, H. Schiver).—Pen of three bullocks, over 4, under 6 years: H. C. Taylor 1 and 2. Pen of three bullocks, under 4 years, special prize: I. J. and M. S. Moore. Pen of three bullocks most suitable for export, special prize: I. J. and M. S. Moore. Pen of three bullocks most suitable for freezing, special prize: I. J. and M. S. Moore. Pen of three Shorthorn bullocks: H. C. Taylor 1 and 2. Pen of three Hereford bullocks: I. J. and M. S. Moore 1, Ferling Bros. 2. Pen of three bullocks, special prize: I. J. and M. S. Moore. Pen of three crossbred bullocks: W. Drynan 1, T. Hawkins 2. Pen of three steers over 2 and under 3 years: I. J. and M. S. Moore 1, H. C. Taylor 2. Pen of three steers under 2 years: H. C. Taylor. Bullock, over 4 and not exceeding 6 years: I. J. and M. S. Moore 1, J. Armstrong 2. Bullock, under 4 years: I. J. and M. S. Moore 1 and 2. Steer, under 3 years: I. J. and M. S. Moore 1 and 2. Cow: W. Drynan. Heaviest bullock, special prize: H. C. Taylor. Bullocks for export: I. J. and M. S. Moore 1, H. C. Taylor 2 Bullock for local consumption: I. J. and M. S. Moore 1, H. C. Taylor 2.

Champion Bullock: I. J. and M. S. Moore.

DAIRY CATTLE.

Illawarra Milking Shorthorns (judges, Messrs. J. J. Hayter and E. J. Marks).—Cow, 5 years and over, in milk: W. Middleton, Mabel of Talgai, 1; A. Pickels, Jean 5th of Blacklands, 2; B. O'Connor, Dahlia 2nd of Hill View, 3; A. J. Caswell, Floss of Dualwon, 4. Four and under 5 years: B. O'Connor, Rosebud 2nd of Greyleigh, 1; R. J. Morgan, Veresdale Ruby, 2; A. J. Caswell, Rosie 4th of Greyleigh, 3. Three and under 4 years: A. C. Payne, Heather 2nd of Hillcrest, 1; B. O'Connor, Skylark 2nd of Cosey Camp, 2; B. O'Connor, Lady James of Cosey Camp, 3. Heifer, 2 and under 3 years: F. O. Hayter, Fully 3rd of Spurfield, 1; P. Mears, Norah 3rd of Morden, 2; Macfarlane Bros., Remembrance 9th of Kilbirnie, 3. Cow, 4 years or over, in calf 6 months or dry: F. O. Hayter, Lady May of Willow Farm, 1; Nestlé and Anglo-Swiss Co., Gold 3rd of Nestlés, 2; J. H. Wade, Red Brier of Wadedale, 3. Three and under 4 years: J. Phillips, Nancy 2nd of Greyleigh, 1; Macfarlane Bros., Viola 26th of Darbalara, 2. Heifer, 2 years and under 3 years: W. M. Kruse, Brooklin Gentle of Greyleigh, 1; F. O. Hayter, Buttercup 4th of Hill View, 2; F. O. Hayter, Countess 3rd of Wingewah, 3. Heifer, 2 years and under 3: R. Mears, Bonnie 3rd of Morden, 1; C. Keys, Dolly of Sunnymeade, 2; A. C. Payne, Vision 2nd of Burradale, 3. Children's calf class: cow or heifer giving greatest yield of butter-fat in 24 hours: J. H. Wade, Red Brier of Wadedale, 1; R. J. Morgan, Hippy 2nd of Springdale, 2; J. Phillips, Chance of Woodlight, 3; R. J. Morgan, Veresdale Ruby, 4. Champion Illawarra Milking Shorthorn cow: B. O'Connor, Rosebud 2nd of Greyleigh. Reserve champion: W. Middleton's Mabel of Tailgai.

Bull, 3 and under 4 years: Nestlé and Anglo-Swiss Milk Co., Ltd., Royal George 2nd of Nestlés, 1; B. O'Connor, Charm's Duhalow of Oakvale, 2; H. C. Payne, Raleigh's Reflection of Glenthorn, 3. Two and under 3 years: Ahern Bros., Ly-Light of Berkeleydale, 1; Macfarlane Bros., Mowbray 2nd of Kilbirnie, 2; Mrs. J. Handley, Claret of Oakvale, 3. One and under 2 years: B. O'Connor, Brilliant of Oakvale, 1; J. England, Pretty Boy of Cosey Camp, 2; Macfarlane Bros., Arym of Kilbirnie, 3. Bull calf, 6 and under 12 months: C. Keys, Radium of Sunnymeade, 1; A. Kent, Rosebud's Renown of Oakvale, 2; A. C. Payne, Heather's Heir of Springvale. Children's calf class: Bull calf, 6 and under 12 months—E. J. O'Connor, Jock of Oakvale. Sire and three of his progeny, 6 months and over: F. O. Hayter, Sovereign of Warden, 1; R. Mears, George of Nestlés, 2; A. C. Payne, Raleigh's Reflection of Glenthorn, 3. Group of 2 males, 6 months or over: B. O'Connor, 1; F. O. Hayter, 2; Macfarlane Bros., 3. Sires' progeny stakes group, three females or a male and 2 females, 1 year and over: B. O'Connor, 1; W. Middleton, 2. Champion Illawarra milking bull: Nestlé and Anglo-Swiss Milk Co., Royal George 2nd of Nestlé. Reserve champion bull: G. E. Chasling, Thor of Greyleigh. Heifer calf, 6 months and under 12 months: D. Spoor and Sons, Bella of Aurora, 1; F. O. Hayter, Fussy's Pride of Springfield, 2; B. O'Connor, Lady Jean of Oakville, 3. Children's calf class: Heifer, 6 and under 12 months—J. B. O'Connor, Elsie 7th of Oakvale. Bull, 4 years and over: G. E. J. Chaseling, Thor of Greyleigh, 1; W. Middleton, Gay Boy of Tyrone Villa, 2; F. O. Hayter, Sovereign of Warden, 3; Nestlé and Anglo-Swiss Co., Shamrock's Emblem of Berry, 4.

Jerseys (judge, W. Woodmason).—Cow, 5 years and over, in milk: J. Sinnamon, Oxford Barleycorn, 1; J. Williams, Carlyle Lady Lynn, 2; W. Spresser, Carnation Buttercup, 3; J. Sinnamon, Oxford Hazel, 4. Four and under 5 years: E. Burton and Sons, Oxford Golden Buttercup, 1; J. Duffield and Sons, Creole of Brooke Lodge, 2; W. Spresser, Carnation Lucy, 3. Three and under 4 years: J. Duffield and Sons, Goldie of Brooke Lodge, 1; H. H. Doman, Oxford Golden Rosette, 2; W. and D. Carr, Carlyle Larkspur, 3. Heifer, 2 and under 3 years, in milk: W. H. Mallet, Sultan's Pride of Burnleigh, 1; W. and D. Carr, Carlyle Larkspur 3rd, 2; E. Burton and Sons, Oxford Noble Buttercup, 3. One and under 2 years: W. Spresser, Carnation Golden Princess, 1; J. Sinnamon, Trinity Jewel, 2; J. Sinnamon, Trinity Barleycorn 2nd, 3. Cow, 4 years and over, in calf 6 months or dry: J. G. Henderson, Oxford Girl, 1; T. Mullen, Lady Lass 3rd, 2; J. Williams, Oxford Noble Dot 3rd, 3; E. Burton and Sons, Oxford Buttercup 4th, 4. Heifer, 3 and under 4 years, in calf or dry: J. Collins, Queen of Coeton, 1; E. Burton and Sons, Oxford Noble Belle, 2; J. Collins, Trinity Golden Star, 3. Cow, 3 and under 4 years, in calf 6 months or dry: J. Sinnamon,

Trinity Sultan's Lass. Heifer, 1 and under 2 years, dry: E. Burton and Sons, Oxford Golden Dot, 1; W. Spresser, Carnation Kittle Lucy, 2; Sinnamon, Trinity Popcorn, 3. Six and under 12 months: W. Spresser, Carnation Butterfly, 1; W. Spresser, Carnation Lucy's Queen, 2; J. Sinnamon, Trinity Rosetta, 3. Cow or heifer, Australian bred and sired: J. Sinnamon, Oxford Barleycorn, 1; E. Burton and Sons, Oxford Golden Butterfly, 2; J. G. Henderson, Oxford Girl, 3. Greatest yield of butter-fat for 24 hours: J. Williamson, Carlyle Lady Lynn, 1; J. Duffield and Sons, Talgai Creole, 2; J. Sinnamon, Oxford Hazel, 3; J. Sinnamon, Oxford Barleycorn, 4. Champion Jersey cow or heifer of Queensland: J. Sinnamon, Oxford Barleycorn. Reserve champion: E. Burton and Sons, Oxford Golden Buttercup. Bull, 3 and under 4 years: J. Sinnamon, Ginger Duke, 1; W. W. Mallett, Trinity Baron, 2; Mrs. M. Bull, Acacia Crusader, 3. Two and under 3 years: J. Sinnamon, Lord Attrey of Banzule, 1; J. Duffield and Sons, The Ace of Banzule, 2; E. Burton and Sons, Werribee Clementine's King, 3; J. E. Davey, Squire of Abbystead, highly commended. One and under 2 years; J. Collins, Retford K.C., 1; T. H. Petherick, Trinity Officer, 2; J. Sinnamon, Trinity Tomboy, 3; G. W. Young, Sultan's Knight of Brookland, highly commended. Bull calf, 6 and under 12 months: J. Sinnamon, Trinity Derby, 1; J. Sinnamon, Trinity Roadside, 2; J. Sinnamon, Trinity Nicola, 3. Children's calf class.—Bull, 6 and under 12 months: S. Mullen, Norwood La Sentis King, 1; C. H. Hay, Kenmore Prince, 2. Sire and three of his progeny: W. Spresser, Carnation Prince, 1; E. Burton and Sons, Oxford Golden Noble, 2; J. Duffield and Sons, The Ace of Banzule, 3. Group, 2 males 6 months or over and 6 females: J. Sinnamon, 1; E. Burton and Sons, 2; Mrs. M. Ball, 3. Sire's progeny stakes group, 3 females or 1 male and 2 females: E. Burton and Sons, 1; J. Sinnamon, 2. Champion Jersey bull of Queensland: H. M. Bray, Oxford Jubilee's Palatine. Reserve champion: J. Sinnamon, Lord Attrey of Banzule. Bull, 4 years and over: H. M. Bray, Oxford Jubilee's Palatine, 1; E. Burton and Sons, Oxford Golden Noble, 2; W. and D. Carr, Empire of Woodside, 3; W. Spresser, Carnation Prince, 4. Children's calf class.—Heifer calf, 6 and under 12 months: E. M. Hay, Kenmore Princess, 1; R. J. Hay, Kenmore Songstress, 2; R. W. Mollett, Sweetheart of Burnleigh, 3.

Friesians (judge, J. H. S. Angus).—Cow, 4 years and over, in milk: F. G. Brown, S.C.P. Korndyke Lottie Canary, 1; F. G. Brown, Tsussie Clara Lynns' Echo, 2; Nestlé and Anglo-Swiss Co., Greta 6th of Nestlés, 3. Three and under 4 years, in milk: F. G. Brown, Cornucopia Doral Wayne 2nd, 1; P. P. Falt, Melba of Ryfield, 2. Heifer, 2 and under 3 years, in milk: Grindles Ltd., Hamburg 2nd of St. Athan, 1; F. G. Brown, Nooroombin Tsussie Echo, 2. Cow, 3 years or over, in calf 6 months or dry: P. P. Falt, Dairymaid, 1; G. Newman, Pansy of St. Athan, 2; Grindles Ltd., Lady Creamelle, 3. Heifer, 2 and under 3 years, dry: G. Newman, Moonlight 4th of St. Athan, 1; R. C. Philp and R. Betts, Tulip of Hazeldean, 2. One and under 2 years: J. M. Falt, Queenie of Ryfield, 1; E. C. McConnel, Cressbrook Camilla Regina, 2; Nestlé and Anglo-Swiss Co., Milkmaid of Nestlés, 3. Heifer calf, 6 and under 12 months: Grindles Ltd., Creamelle's Pride of Wolston, 1; E. J. Wecker, Brookdale Cadalie Queen, 2; S. H. Hosking, Gwithian Hilma 4th, 3; F. Pearce, Duchess of Oakvale, highly commended. Children's calf class: Heifer calf, 6 and under 12 months—F. Pearce, Pride of Oakvale, 1; J. H. Jorgensen, Oaklea Noreen 3rd of Ryfield, 2; W. Wecker, Martha of Glen Carmal, 3. Cow or heifer giving the greatest yield of butter-fat for 24 hours: P. P. Falt, Oaklea Noreen, 1; F. G. Brown, S.C.P. Korndyke Lottie Canary, 2; P. P. Falt, Melba of Ryfield, 3. Champian Friesian cow or heifer: P. P. Falt, Dairymaid. Reserve champion: G. Newman, Pansy of St. Athan. Bull, 4 years and over: G. Newman, Dominion Domino's Dutch Boy, 1; Grindles Ltd, Black Prince, 2; E. J. Wecker, Prince Colantha Oaklea, 3. Three and under 4 years: G. Newman, Pied Rock, 1; G. P. Falt, Dirk De Kol of Ryfield, 2; R. G. McLeod, Menclaus of St. Athan, 3. Two and under 3 years: F. G. Brown, Mooroombin Tsussie Lyon's Echo, 1; F. Pearce, Damon of St. Gwithian, 2. One and under 2 years: A. Aitchison, Pontiac of St. Gwithian, 1; G. Newman, Briton of St. Athan, 2; G. Newman, Apollinaris of St. Athan, 3. Six and under 12 months: J. P. Jorgensen, Show Lad of Ryfield, 1; E. C. McConnel, Cressbrook Puck, 2; Nestlé and Anglo-Swiss Co., Desmond of Nestlés, 3. Children's calf class: Bull calf, 6 and under 12 months—W. Wecker, Netherland Prince Colantha. Sire and three of his progeny, 6 months and over: G. Newman, Dominion Domino's Dutch Boy, 1;

P. P. Falt, Bell de Kol Ongarue, 2; R. C. Philp and R. Betts, Duke of Brussels of Berry, 3. Group, 2 males 6 months and over and 5 females 6 months and over: G. Newman 1, F. G. Brown 2. Sires' progeny stakes group, 3 females or 1 male and 2 females, 1 year and over: G. Newman 1, R. C. Philp and R. Betts 2, S. H. Hosking 3. Champion Friesian bull of Queensland: Dominion Domino's Dutch Boy. Reserve champion: G. Newman, Pied Rock.

Ayrshires (judge, J. Pritchard).—Cow, 5 years old and over, in milk: Anderson Bros., Juliette of Fairview, 1; Carr Bros., Rosalind of Wanora, 2; J. Holmes, Belle of Longlands, 3; J. Holmes, Blanche of Longlands, 4. Four and under 5 years, in milk: J. Holmes, Blonde of Longlands, 1; Anderson Bros., Lassie Jean of Fairview, 2. Three and under 4 years: J. Holmes, Tidy 2nd of Longlands, 1; J. C. Mann, Beryl's Pride of Crescent Farm, 2; J. Brownlie, Fantasy of Marinya, 3. Heifer, 2 and under 3 years: Feuerriegel Bros., Tina of Marivale, 1; J. Holmes, Jeanette of Marinya, 2. Cow, 4 years old or over, in calf 6 months or dry: P Bell, Agnes of Fairfield, 1; P. Bell, Beauty 3rd of St. Helena, 2; J. Holmes, Rosalind 2nd of Longlands, 3; J. C. Mann, Beryl of Crescent Farm, 4. Three and under 4 years: J. Holmes, Bella of Longlands. Heifer, 2 and under 3 years, in calf or dry: J. C. Mann, Beryl's Gem of Crescent Farm, 1; J. Holmes, Beauty of Longlands, 2; J. Holmes, Quiver 2nd of Marinya, 3. One and under 2 years: J. C. Mann, Daisy of Crescent farm, 1; J. C. Mann, Snowball of Crescent Farm, 2; G. Bell, Pearl 2nd of Longlands, 3. Heifer calf, 6 and under 12 months: J. Holmes, Betty of Longlands, 1; J. Holmes, Belle 2nd of Longlands, 2; J. C. Mann, Heather Spray of Crescent farm, 3. Ayrshire Derby Sweepstakes: Feuerriegel Bros., Tena of Merivale. Cow or heifer giving the greatest yield of butter: J. Holmes, Rosalind 2nd of Longlands. Champion Ayrshire cow or heifer of Queensland: Anderson Bros., Juliette of Oakbank. Reserve champion: P. Bell, Agnes of Fairfield. Bull, 4 years and over: P. Bell, Prince Boy of Longlands, 1; Anderson Bros., Royalist of Wanora, 2; Carr Bros., Master Gay Boy, 3. Three and under 4 years: J. Holmes, Prince Boy of Fairview, 1; J. Brownlie, Ross of Lowlands, 2; P. Bell, Jamie of Fairfield, 3. Two and under 3 years: J. C. Mann, Heather Boy of Crescent Farm, 1; H.M. Penal Establishment at St. Helena, St. Helena Tina's Earl, 2; P. Bell, Trumps of Bellevue, 3. One and under 2 years: H.M. Penal Establishment at St. Helena, St. Helena Bruce, 1; H. E. Luck, Bonnie Boy of Marinya, 2; H.M. Penal Establishment at St. Helena, St. Helena Gallant, 3. Bull calf, 6 and under 12 months: H.M. Penal Establishment, St. Helena Marshal, 1; J. Holmes, Tomboy of Longlands, 2; H.M Penal Establishment at St. Helena, St. Helena Mischief Boy, 3. Group, sire and three of his progeny, 6 months old and over: P. Bell, Prince Boy of Longlands, 1; J. Holmes, Prince Boy of Fairfield, 2. Two males, 6 months or over: J. Holmes, 1; J. C. Mann, 2. Sires' progeny stakes groups, 3 females or 1 male and 2 females: Anderson Bros. and J. Holmes, tie, 1. Champion Ayrshire bull of Queensland: P. Bell, Prince Roy of Lowlands. Reserve champion bull: Anderson Bros., Royalist of Wanora.

Guernseys (judge, E. Burton).—Cow, 3 years and over, in milk: E. S. Webster, Peggy 3rd of Belmont, 1. Three years and over, in calf six months or dry: Jackson and Schofield, Ivy 2nd, 1; E. S. Webster, Necklace of Woollongbar, 2. Heifer, 2 and under 3 years: A. Cooke, Shamrock 6th, 1; A. Cooke, Rohais, Keepsake of Kelvin, 2. Two and under 3 years: Jackson and Schofield, Mona of Bexley, 1; A. Cooke, Fashion of Boorie, 2. One and under 2 years: Jackson and Schofield, Mary of Bexley, 1; E. S. Webster, Minnamurra Queen, 2. Bull, 3 years and over: Jackson and Schofield, Montrose Sequel, 1; E. S. Webster, Air King of Woollongbar, 2. Two and under 3 years: A. Cooke, Victor of Woollongbar, 1. One year and under 2: Jackson and Schofield, Donnington Boy, 1. Champion Guernsey bull: Jackson and Schofield, Montrose Sequel. Reserve champion bull: A. Cooke, Victor of Woollongbar. Bull calf, 6 months and under 12 months: Jackson and Schofield, Captain of Bexley, 1; Jackson and Schofield, Lieutenant of Bexley, 2. Group of 1 male and 4 females: S. Cooke 1. Heifer, 6 and under 12 months: Jackson and Schofield, Coquette, 1; E. S. Webster, Minnamurra Eclipse, 2. Champion Guernsey cow or heifer of Queensland: Jackson and Schofield, Ivy 2nd. Reserve champion: Jackson and Schofield, Mona of Bexley. Champion Guernsey bull of Queensland: Jackson and Schofield, Montrose Sequel. Reserve champion: A. Cooke, Victor of Woollongbar.

HORSES.

Stud trotters and pacers (judge, Mr. H. J. Gidney).—Stud book stallion, 6 years and over, with public record of 2 mins. 35 secs. to the mile or better: J. Rice, Rex Wilkes, 1; J. T. Scrymgeour, St. Lucia Lad, 2. Stallion, 5 years and over, tested for speed, conformation, and action over 1 mile: F. Cook, Longford. Stallion, 3 years, tested for speed, conformation, and action over 1 mile: W. G. Arnold, Delor Rex; time, 4 mins. 20¼ secs. Mare, 5 years old: J. Rice, Ella Wilkes, 1; W. J. Young, Golden Queen, 2. Filly, 3 years: S. E. Green, Roma's Pride, 1; R. Smythe, Purplewood, 2. Family group, sire and two of his progeny: J. Rice, Rex Wilkes, 1. Champion trotting stallion: J. Rice, Rex Wilkes. Reserve Champion: J. T. Scrymgeour, St. Lucia Lad. Champion trotting mare: J. Rice, Ella Wilkes. Reserve champion: W. J. Young, Golden Queen.

Heavy draught horses, Clydesdales (judge, Mr. R. Tait).—Stallion, 5 years and over: A. T. Creswick, Wendermere Boy Kennedy, 1; A. T. Creswick, Captain Dale, 2; J. H. Kilvington, Pride o' Glenore, 3. Stallion, 4 years: G. Elliot, Statesman. Stallion, 3 years: A. T. Creswick, Major, 1; W. Irvine, Young Wendermere, 2. Colt, 2 years: W. Frood, Glentyre, 1; G. Elliot, Opportunity, 2. Colt, 1 year: J. H. Kelvington, Willie. Mare, 5 years and over: J. H. Kelvington, Winsome Baroness, 1; G. Elliot, Lady Ullus, 2. Mare, 4 years: G. Elliot, Lady Meta. Brood mare: J. Hamilton, Heather Belle, 1; J. H. Kelvington, Maiden Hair, 2. Filly, 3 years: G. Elliot, Lady Rangatira, 1; J. H. Kelvington, Madge, 2. Filly, 2 years: A. T. Creswick, Florrie, 1; J. H. Kelvington, Gipsy, 2. Family group, sire and 2 progeny: J. H. Kelvington, Pride o' Glenore, 1. Champion draught stallion: A. T. Creswick, Wendermere Boy Kennedy. Reserve champion: A. T. Creswick, Major. Champion draught mare: A. T. Creswick, Beryl. Reserve champion: J. H. Kilvington, Winsome Baroness.

Stud ponies (judge, Mr. P. E. Thorne).—Stallion, any age, exceeding 14 hands, to be driven in harness: A. T. Noyes, Robin Hood, 1; Mrs. T. Simpson, The Welshman, 2. Stallion, any age, to be led: H. E. Cox, Commandant, 1; J. C. Hobbs, Don, 2. Any age, not exceeding 13 hands: A. T. Noyes, Robin Hood, 1; H. Arndt, Black Pastel, 2. Any age, not exceeding 12 hands: C. J. Hobbs, Don, 1; Mrs. T. Simpson, The Welshman, 2. Pony stallion, any age, not exceeding 14 hands: E. Pocock, Ludo. Not exceeding 13 hands: E. Pocock, Ludo, 1; W. H. Maxwell, Welsh Gleam, 2. Not exceeding 12 hands: F. Tucker, Bonnie Boy. Champion pony stallion: E. Pocock, Ludo.

Welsh Ponies.—Stallion, not exceeding 14 hands: A. T. Noyes, Robin Hood, 1; Mrs. T. Simpson, The Welshman, 2. Champion Welsh pony stallion: A. T. Noyes, Robin Hood. Reserve champion: Mrs. T. Simpson, The Welshman.

Pony Mares.—Brood mare, not exceeding 14 hands: L. Dobson, Llew Lass, 1; M. Livingstone, Trixie, 2. Not exceeding 13 hands: Miss A. Mullan, Gold Top, 1; R. C. Fog, Girlie, 2. Not exceeding 12 hands: A. T. Noyes, Banglet, 1; W. Eaves, Blue Bell, 2. Champion pony mare: Miss A. Mullan, Gold Top. Reserve champion: L. Dobson, Llew Lass.

Thoroughbreds (judge, H. J. Gidney).—Stallion, 4 years and over, best adapted for improving racing stock: M. F. Yore, Polybius, 1; T. Jennings, Amberdown, 2; W. Glasson, Lilyveil highly commended. Four years and over, most suitable for getting horses for military purposes: T. Jennings, Amberdown, 1; J. P. Curry, Ladomond, 2. Colt, 2 years: E. G. Blume. Colt or filly, 2 years: E. G. Blume. Mare, 4 years and over: E. G. Blume, Lady Shepherd, 1; M. Livingstone, Bonnie Wasa, 2. Filly, 3 years: M. Livingstone, Malanganee. Two years: M. Livingstone. Champion thoroughbred stallion: M. F. Yore, Polybius. Reserve champion: T. Jennings, Amberdown. Champion thoroughbred mare: E. G. Blume, Lady Shepherd. Reserve champion mare: M. Livingstone, Malanganee.

SHEEP.

Stud Sheep (judges, Donald Gunn and W. A Nason).—Merinos—Strong woolled (unhoused) ram, 3 years and over: R. Lord, 1 and 2. Two years and under 3: R. P. Lord, 1, 2, and 3. Under 2 years, to have been shorn as a lamb: R. P. Lord, 1 and 2. Ewe, 3 years and over: R. P. Lord, 1 and 2. Two and under 3: R. P. Lord, 1 and 2. Under 2 years, to have been shorn as a lamb: R. P. Lord. Medium woolled (unhoused) ram, 3 and over: R. P. Lord, 1 and 2. Two and under 3: R. P. Lord, 1 and 2. Under 2, to have been shorn as a lamb: R. P. Lord, 1 and 2. Ewe, 3 years and over: R. P. Lord, 1 and 2. Two and under 3: R. P. Lord, 1 and 2. Under 2, to have been shorn as a lamb: R. P. Lord. Fine woolled (unhoused) ram, 3 and over: R. P. Lord, 1 and 2. Two and under 3: H. M. Collins, 1; R. P. Lord, 2 and 3. Under 2, to have been shorn as a lamb: R. P. Lord. Ewe, 3 and over: R. P. Lord, 1 and 2. Two and under 3: R. P. Lord, 1 and 2.

Championships.—Strong woolled (unhoused) ram, champion and reserve: R. P. Lord. Ewe, champion and reserve: R. P. Lord. Medium woolled (unhoused) ram, champion and super. champion and reserve: R. P. Lord. Ewe, champion and reserve: R. P. Lord. Fine woolled (unhoused) ram, champion: H. M. Collins; reserve, R. P. Lord. Ewe, champion and reserve: R. P. Lord.

Fats (judge, W. A. Nason).—Pen of five merino wethers, over 50 lb. weight: H. C. Taylor, 1 and 2. Pen of five merino wethers, under 50 lb. weight: Whitney Pastoral Company, 1; W. B. Beel, 2. Pen of five merino wethers, most suitable for freezing: G. Tathem, 1; H. C. Taylor, 2. Pen of five merino wethers, most suitable for butcher's trade: H. C. Taylor, 1 and 2. Pen of five crossbred wethers, 70 lb. weight: J. H. Fairfax. Special prize, pen of five crossbred wethers, all one cross, of freezing quality: J. H. Fairfax. Special prize, pen of five wethers most suitable freezing: G. Tathem, 1; H. C. Taylor, 2. Pen of five crossbred lambs, suitable for export as freezers, averaging 38 lb.: J. H. Fairfax, 1; W. L. Stirling, 2. Pen of five crossbred lambs, irrespective of weight: J. H. Fairfax, 1; W. L. Stirling, 2. Special prize, pen of ten fat lambs, most suitable for export, from 28 to 40 lb.: Stirling Bros. Pen of five lambs, any breed, most suitable freezing: J. H. Fairfax, 1; W. L. Stirling, 2.

Single Exhibits.—Heaviest crossbred wether: R. Ralston, 1; W. L. Stirling, 2. Heaviest merino wether: H. C. Taylor, 1 and 2. Heaviest crossbred ewe: J. H. Fairfax. Heaviest merino ewe: H. C. Taylor, 1 and 2.

SWINE.

Improved Berkshires (judge, R. Fennell).—Boars, 2 years and over: J. H. Cowen, Goomalibee Nugget, 1; W. J. Warburton, Northgate Item 2nd, 2. One and under 2 years: W. J. Warburton, Brentwood Star, 1; J. H. Cowen, Preston Sunshine, 2. Six months and under 1 year: W. J. Warburton, Dick, 1; W. J. Warburton, Cloud, 2. Under 6 months: J. H. Cowen, Cremorne Mat, 1; L. S. Ducat, Waterview Don, 2. Pen of three Berkshire boars: L. S. Ducat. Boar and three of his progeny: W. J. Warburton, Northgate Item 2nd, 1; J. H. Cowen, Preston Sunshine, highly commended. Champion boar: J. H. Cowen, Goomalibee Nuggett. Reserve champion: W. J. Warburton, Brentwood Star. Sows, 2 years and over: E. Burton and Sons, Oxford Marie, 1; J. H. Cowen, Lawrence Countess, 2; Queensland Agricultural College, Brentwood Purity, highly commended. One year and under 2 years: W. J. Warburton, Northgate Belle 2nd, 1; L. S. Ducat, Britannia Ruby, 2. Over 6 and under 12 months: W. J. Warburton, Floria, 1; W. J. Warburton, Jean, 2. Under 6 months: W. J. Warburton, Pet, 1; J. H. Cowen, Cremorne Patricia, 2. Sow, any age, in milk, with litter not over ten weeks old (not less than six suckers): Northgate Benita 2nd, 1; Northgate Virtue, 2. Pen of three Berkshire sows, under 16 weeks: J. H. Cowen. Champion sow: W. J. Warburton, Northgate Belle 2nd. Reserve champion: E. Burton and Sons, Oxford Marie.

Yorkshires.—Boars, 2 years and over: W. J. Warburton, Northgate My Lad, 1; J. G. Weller, Northgate Aussie, 2. One and under 2 years: W. J. Warburton, Newington Adventure, 1; W. J. Warburton, Northgate Fanciful, 2. Six and under 12 months: W. J. Warburton, Northgate Bob, 1; W. J. Warburton, Northgate Star, 2. Under 6 months: W. J. Warburton, Ted, 1; Queensland Agricultural College, 2. Pen of three Yorkshire boars, under 16 weeks: W. J. Warburton, 1; Queensland Agricultural College, 2. Boar and three of his progeny (sex optional): W. J. Warburton, Northgate My Lad. Champion boar: W. J. Warburton, Northgate My Lad. Reserve champion: W. J. Warburton, Northgate Star. Sows, 2 years and over: W. J. Warburton, Northgate Shirley. One year and under 2 years: W. J. Warburton, Northgate Florrie. Six and under 12 months: Northgate Jess. Under 6 months: Queensland Agricultural College, 1; W. J. Warburton, Nora, 2. Sow, any age, in milk, with litter of not less than six suckers and not over 10 weeks old: W. J. Warburton, Northgate Joan, 1; Queensland Agricultural College, Gatton, Mistress Gaiety, 2. Pen of three Yorkshire sows, under 16 weeks: Queensland Agricultural College, 1; Warburton, 2. Champion: W. J. Warburton, Northgate Florrie. Reserve champion: W. J. Warburton, Northgate Shirley.

Tamworths.—Boars, 2 years and over: Queensland Agricultural College, Knowle Chatham, 1; J. H. Whittaker, Sandy McQueen, 2. One and under 2 years: J. H. Whittaker, Broxburn King. Six and under 12 months: J. H. Whittaker, Broxburn Lad. Under 6 months: J. H. Whittaker, Broxburn Baron. Pen of three Tamworth boars, under 16 weeks: Queensland Agricultural College. Boar and three of his progeny: Queensland Agricultural College, Knowle Chatham and progeny. Champion: Queensland Agricultural College, Knowle Chatham. Reserve champion: J. H. Whittaker, Sandy McQueen. Sows, 2 years and over: J. H. Whittaker, Manning Ruby. One year and under 2 years: J. H. Whittaker, Braxburn Myra, 1; Queensland Agricultural College, Gatton Princess, 2. Six months and under 12 months: Queensland Agricultural College 1; J. H. Whittaker, Broxburn Lass, 2. Under 6 months: J. H. Whittaker, Broxburn Favourite. Any age, in milk, with litter not less than six suckers and not over 10 weeks old: J. H. Whittaker, Broxburn Queen. Pen of three Tamworth sows, under 16 weeks: J. H. Whittaker. Champion sow: J. H. Whittaker, Broxburn Myra, 1. Reserve.

Duroc-Jerseys.—Boar, any age: F. G. Brown, Nooroonbin Lad. Sow, any age: F. G. Brown, 1 and 2.

Miscellaneous.—Three bacon pigs, any breed, 100 to 130 lb. dressed weight: A. Gratt, 1; H. B. Baldwin, 2. Three porker pigs, 60 to 80 lb.: Queensland Agricultural College, 1; C. Bright, 2.

HAM, BACON, AND LARD.

(Judge, G. S. Stening.)

Bacon, factory cured, six sides: J. C. Hutton, Proprietary, Limited, Brisbane, 94 points, 1; J. C. Hutton Proprietary, Limited, Canterbury, N.S.W., 93 points, 2.

Hams, factory cured, six: J. C. Hutton, Proprietary, Limited, Brisbane, 93½ points, 1; J. C. Hutton, Proprietary, Limited, Canterbury, N.S.W., 92 points, 2.

Sausage, smoked, 14 lb.: Queensland Co-operative Bacon Company, Limited, 1 and 2.

Lard, in bladders, 14 lb.: Queensland Co-operative Bacon Company, Limited, 1 and 2, with 96½ and 96 points, respectively.

FRUIT-PACKING COMPETITION FOR BOYS AND GIRLS.

Two cases of oranges, open to past students of the rural schools and those over 14 years of age now attending school: N. Dunning, Palmwoods, 92 points, 1; L. Atkinson, Palmwoods, 85 points, 2; M. Young, Palmwoods, 82 points, 3; Am. Miler, Palmwoods, 74 points, highly commended; L. Atkinson, Palmwoods, 74 points, highly commended. Two cases of oranges, open to students of the rural schools under 14 years of age: H. Watt, Mapleton, 93 points, 1; H. Wallace, Palmwoods, 90 points, 2; G. Butt, Montville, 86 points, 3; A. Cook, Mapleton, 84 points, highly commended; L. Wyer, Mapleton, 77 points, highly commended; M. Thompson, Montville, 78 points, highly commended. District exhibits of fruit, pineapples: Montville. Citrons: Montville. Fruit packed for the market: Montville. Bananas: Wynnum and Manly. In a collection of bananas, pineapples, citrus fruits, custard apples, papaws, strawberries, and other fruits, packing and general display being taken into account: Woombye, Nambour, and Yandina district, 145 points, 1; Montville district, 116 points, 2; Redlands district, 115 points, 3.

DISTRICT FRUIT EXHIBIT.

GOOD COMPETITION.

SUCCESS OF WOOMBYE-NAMBOUR-YANDINA.

The judging in the district exhibit of fruit was completed on Tuesday, and the aggregate of the detailed points resulted in a win for the Woombye, Nambour, and Yandina district exhibit, with a total of 145 points out of a possible 200. The Montville Fruitgrowers', Farmers, and Progress Association was second with 116, and Redlands Area Council exhibit third with 115. Details:—

	Possible Points.	Woombye, Nambour and Yandina District.	Montville Fruitgrowers' Farmers' Progress Assoc.	Redland's Area Council.	Buderim Mountain District.	Cooran, Pinbarren, and Kin Kin.
Bananas	35	12	14	12	15	25
Pineapples	35	30	23	20	15	15
Citrus fruits	35	30	20	20	19	1
Custard apples	10	4	6	9	5	..
Papaws	10	7	7	7	6	5
Strawberries	10	7	..	8	6	..
All other fruits	10	8	6	2	7	2
Grading and packing	35	30	25	27	16	10
General display	20	17	15	10	8	5
Total	200	145	116	115	97	63

FERTILISERS—UNIT VALUES PRICE PER TON.

By F. F. COLEMAN, Officer in Charge, Seeds, Fertilisers, and Stock Foods Investigation Branch.

Farmers and other buyers would do well to note that every licensed dealer must give the buyer an invoice certificate, and affix to every package a plainly printed label, each of which is required to set out the weight, name of fertiliser, also the chemical analysis stating the percentage of nitrogen, phosphoric acid, and potash and the *forms in which they respectively occur*.

In the case of bonedust, bonemeals, and meatworks fertiliser, other than dried blood, the percentage of fine and coarse material should be declared.

On all invoice certificates and labels the amounts of fertilising ingredients have to be stated in a uniform manner, as the old expressions—like bone phosphate, tricalcic phosphate, ammonia, ammonium sulphate, potassium sulphate, &c.—are liable to mislead the farmer. The Act provides for the statement of the valuable fertilising ingredients in percentage amounts of **Nitrogen** (N), **Potash** (K_2O), **Phosphoric Acid** (P_2O_5).

In the case of **agricultural lime** the percentage of coarse material and fine material must be stated, together with the percentage of lime as **lime carbonate** ($CaCO_3$), and in the case of gypsum the percentage of **lime sulphate** ($CaSO_4$). With burnt lime or quick lime the percentage of **calcium oxide** (CaO) must be declared.

The Fertilisers Acts do not prescribe standards for fertilisers. Therefore the value of any particular brand or kind can only be calculated on the fertilising constituents guaranteed by the vendor to be present. In particular, it is to be noted that, although meatworks and fertilisers of a like nature vary from time to time, they are still sold under the same brand or trade mark, and their actual value per ton may be up or down in accordance with the percentage of nitrogen, phosphoric acid, and potash that they contain.

The **monetary manurial value** per ton has been fixed for some time under "*The Profiteering Prevention Act of* 1920." The **unit values,** which are the cost price of 1 per centum of the various fertilising constituents per ton, or the actual cost value of every 22·4 lb. of such constituent.

The present unit values were fixed by Prices Notifications Nos. 386 and 396, which appeared in the "Government Gazettes" of 7th October, 1922, and 4th November, 1922, and are as follows :—

The maximum price f.o.b. or f.o.r. to any buyer of any fertiliser as specified herein, of half-ton lots and over, shall be based on registered analysis or certified actual analysis, as under: —

	Unit Value. s. d.
Per Unit of Nitrogen (N) —	
As Nitrate of Soda	30 0
As Ammonium Sulphate	20 0
As dried blood, or blood manure only	24 0
As bone, flesh, blood and offal, fine	24 0
As bone, flesh, blood and offal, coarse	20 0
As bone, flesh, blood and offal, unspecified	17 0
As bone, flesh, blood and offal, unspecified lumps	14 0
Per Unit of Phosphoric Acid (P_2O_5)—	
As Water Soluble in Superphosphate	8 6
As Citrate Soluble in Basic Superphosphate	8 6
As Citrate Soluble in Finely Ground Thomas Phosphate or Basic Slag	8 6
As Citrate Soluble in Finely Ground Mineral or Rock Phosphate	5 6
As Citrate Insoluble in Ground Mineral or Rock Phosphate	4 0
Unspecified	3 0
As Citrate Soluble in Finely Ground Island Phosphate and Guano	5 6
As bone, fine	5 6
As bone, Island Phosphate and Guano, coarse	4 0
As bone, Island Phosphate and Guano, unspecified and unspecified lumps	3 0
Per Unit of Potash (K_2O)—	
As Muriate	8 0
As Sulphate	9 6
Unspecified, Water Soluble	7 6
Unspecified, soluble in Hydrochloric Acid	4 3
Per Unit of Lime (CaO)—	
As Ground Carbonate (in mixtures only)	1 0
As Sulphate (in mixtures only)	1 3

DEFINITIONS.

"Fine" to signify in the case of—

(*a*) Thomas phosphate or basic slag, particles smaller than one-hundredth of an inch.

(*b*) Rock phosphates and guano phosphates, particles smaller than one-fiftieth of an inch.

(*c*) Bone, flesh, and offal, particles smaller than one-fiftieth of an inch.

"Coarse" to signify particles larger than one-fiftieth of an inch and smaller than one-tenth of an inch.

"Unspecified" to signify particles larger than one-tenth of an inch and smaller than one-half of an inch.

"Unspecified lumps" to signify particles larger than one-half inch.

The "unit value" for all fertilisers applies in an area within a radius of 10 miles from the G.P.O., Brisbane, and for all meatworks products, and guano and island phosphates, or any other natural product, to the areas in which the factory is located or the product is obtained.

For all fertilisers scheduled, the state of fineness must be declared by stating the percentage amounts of "fine," "coarse," and "unspecified" particles in the product.

For fertilisers like superphosphates, nitrate of soda, ammonium sulphate, and mixed fertilisers containing any of these fertilisers liable to destroy the bags in short periods, a rebagging charge of 13s. per ton may be allowed, if such rebagging has actually become necessary.

Mixed artificial fertilisers containing superphosphates, and ammonium sulphate or muriate of potash, or both, or for any manure other than basic superphosphate, specially mixed for trade purposes, an extra charge of £1 per ton for mixing may be made, and for basic superphosphate a special mixing charge of thirty shillings (30s.) per ton may be made.

Dealers purchasing from meatworks or bacon factories or Island Phosphate and Guano companies or any other producers, and selling from stock, may charge in half-ton lots or over : 10 per cent. on maximum prices fixed.

Dealers and producers, selling from stock, may charge in lots of 1 cwt. and over, but less than half-ton, 1s. per cwt. extra on maximum prices fixed.

For fertiliser works at and north of Mackay, on account of increased cost of labour and handling, an extra additional charge of five (5) per cent. will be allowed to be made on the calculated total cost.

The maximum price that may be charged for any fertiliser can be easily ascertained on reference to the "Ready Reckoner for Fertilisers," from which it will be observed that the top lines give the various unit values, from 1s. to 30s., and the margin lines the percentages from ·1 of 1 per cent. to 20 per cent.

Assuming that a farmer purchases a ton of fertiliser and the analysis shown on the label is as follows :—

EASTERBY'S MIXTURE.

180 lb. net.

Nitrogen	7·7 per cent. as ammonium sulphate.
Phosphoric acid ..	7·0 per cent. as water soluble phosphoric acid.
Potash	7·7 per cent. as potassium sulphate.

A. SELLER, SUMMERTOWN.

The price can be calculated by first taking the top item of the analysis appearing on the label, which is Nitrogen as ammonium sulphate, the unit value of which is 20s. and the amount guaranteed to be present 7·7 per cent.

On reference to the "Ready Reckoner" it will be found that—

	£	s.	d.
·7 per cent. at 20s. is given as	0	14	0
7 per cent. at 20s. is given as	7	0	0
The unit value of Phosphoric Acid water soluble is 8s. 6d. On reference to the 8s. 6d. column, it will be found that 7 per cent. at 8s. 6d. is given as	2	19	6
The unit value of Sulphate of Potash is 9s. 6d. From the label it appears that the vendor guarantees 7·7 per cent. to be present, the buyer will therefore take ·7 per cent. at 9s. 6d. which is given as	0	6	8
and 7 per cent. at 9s. 6d. which is given as	3	6	6
add £1 per ton for mixing charge	1	0	0
Cost of one ton at Brisbane	£15	6	8

On the sale of bonedust, bonemeals, and meatworks fertiliser, other than dried blood, the vendor should set out on both the label and invoice certificate the percentage of fine and coarse material as defined. For example, a label showing a mixture of meatworks fertiliser and potash is given.

MEATWORKS POTASH MIXTURE.

140 lb. net.

Nitrogen as bone, flesh, blood, and offal	5·2 per cent.
Phosphoric acid—Total	12·7 per cent.
Potash as potassium sulphate	7·5 per cent.
Fine material	55·0 per cent.
Coarse material	40·0 per cent.
Unspecified material	5·0 per cent.

A. SELLER, SUMMERTOWN.

From the above label it will be noted that the fineness is expressed as 55 per cent. fine, 40 per cent. coarse, and 5 per cent. unspecified. On reference to the unit values it will be observed that the unit value of nitrogen as bone, flesh, blood, and offal, fine is 24s., coarse 20s., unspecified 17s., and in phosphoric acid as bone, fine 5s. 6d., coarse 4s., unspecified 3s. To ascertain the price, it is therefore first necessary to find 55, 40, and 5 parts of 5·2 units of nitrogen, and in the phosphoric acid the same percentages of 12·7 units which is the total amount of phosphoric acid declared by the vendor to be present.

When working out the price per ton, it is to be remembered that one unit is 1 per cent. of one ton; therefore the cost of the fertiliser is calculated in the following manner:—

Total nitrogen 5·2 units divided into 55, 40, and 5 parts—

	Calculate as		£ s. d.	£ s. d.
5·2 ·55 260 260				
2·860 = 2·86	2·9	Fine at 24s.	3 9 7	
5·2 ·4				
2·08 = 2·08	2·1	Coarse at 20s.	2 2 0	
5·2 ·05				
·260 = ·26	·2	Unspecified at 17s. ..	0 3 5	
				5 15 0

Total phosphoric acid 12·7 units divided into 55, 40, and 5 parts—

12·7 ·55 635 635	Calculate as					
6·985 = 6·985	7·0	Fine at 5s. 6d.	1	18	6	
12·7 ·4 5·08 = 5·08	5·1	Coarse at 4s.	1	0	5	
12·7 ·05 ·635 = ·635	·6	Unspecified at 3s. ..	0	1	10	
						3 0 9

7·5 units potash as potassium sulphate—

7·5 at 9s. 6d.		3	11 3
Mixing charge		1	0 0
Price per ton at works	£	13	7 0

For fertiliser works at and north of Mackay an additional charge of five (5) per cent. may be added to the calculated total cost.

When the Buyer is in Doubt.

Any farmer in doubt as to the quality or any other matter concerning any fertiliser that he has purchased, should at once write to the Department of Agriculture, Brisbane.

Samples under certain conditions laid down by the Regulations under the Acts may be sent to the Department for analysis. To a buyer, other than a dealer, the charge is only nominal. In most cases, however, the quickest and best method of deciding any point in connection with a purchase is to write to the Department giving the following particulars:—

Name of fertiliser :	Invoice certificate and label :
Name and address of seller :	Date of delivery :
Quantity purchased :	Name and address of buyer :

All correspondence should be addressed to—

The UNDER SECRETARY,

Department of Agriculture and Stock, Brisbane.

READY RECKONER FOR FERTILISERS.

%	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%
	0 1 0	0 1 3	0 2 6	0 3 0	0 3 6	0 4 0	0 4 3	0 4 6	0 5 0		
·1	0 0 1	0 0 1½	0 0 3	0 0 4	0 0 4	0 0 5	0 0 5	0 0 5	0 0 6		·1
·2	0 0 2	0 0 3	0 0 6	0 0 7	0 0 8	0 0 10	0 0 10	0 0 11	0 1 0		·2
·3	0 0 4	0 0 4½	0 0 9	0 0 11	0 1 1	0 1 2	0 1 3	0 1 4	0 1 6		·3
·4	0 0 5	0 0 6	0 1 0	0 1 2	0 1 5	0 1 7	0 1 8	0 1 10	0 2 0		·4
·5	0 0 6	0 0 7½	0 1 3	0 1 6	0 1 9	0 2 0	0 2 1½	0 2 3	0 2 6		·5
·6	0 0 7	0 0 9	0 1 6	0 1 10	0 2 1	0 2 5	0 2 7	0 2 8	0 3 0		·6
·7	0 0 8	0 0 10½	0 1 9	0 2 1	0 2 5	0 2 10	0 3 0	0 3 2	0 3 6		·7
·8	0 0 10	0 1 0	0 2 0	0 2 5	0 2 10	0 3 2	0 3 5	0 3 7	0 4 0		·8
·9	0 0 11	0 1 1½	0 2 3	0 2 8	0 3 2	0 3 7	0 3 10	0 4 1	0 4 6		·9
1·0	0 1 0	0 1 3	0 2 6	0 3 0	0 3 6	0 4 0	0 4 3	0 4 6	0 5 0		1·0
2·0	0 2 0	0 2 6	0 5 0	0 6 0	0 7 0	0 8 0	0 8 6	0 9 0	0 10 0		2·0
3·0	0 3 0	0 3 9	0 7 6	0 9 0	0 10 6	0 12 0	0 12 9	0 13 6	0 15 0		3·0
4·0	0 4 0	0 5 0	0 10 0	0 12 0	0 14 0	0 16 0	0 17 0	0 18 0	1 0 0		4·0
5·0	0 5 0	0 6 3	0 12 6	0 15 0	0 17 6	1 0 0	1 1 3	1 2 6	1 5 0		5·0
6·0	0 6 0	0 7 6	0 15 0	0 18 0	1 1 0	1 4 0	1 5 6	1 7 0	1 10 0		6·0
7·0	0 7 0	0 8 9	0 17 6	1 1 0	1 4 6	1 8 0	1 9 9	1 11 6	1 15 0		7·0
8·0	0 8 0	0 10 0	1 0 0	1 4 0	1 8 0	1 12 0	1 14 0	1 16 0	2 0 0		8·0
9·0	0 9 0	0 11 3	1 2 6	1 7 0	1 11 6	1 16 0	1 18 3	2 0 6	2 5 0		9·0
10·0	0 10 0	0 12 6	1 5 0	1 10 0	1 15 0	2 0 0	2 2 6	2 5 0	2 10 0		10·0
11·0	0 11 0	0 13 9	1 7 6	1 13 0	1 18 6	2 4 0	2 6 9	2 9 6	2 15 0		11·0
12·0	0 12 0	0 15 0	1 10 0	1 16 0	2 2 0	2 8 0	2 11 0	2 14 0	3 0 0		12·0
13·0	0 13 0	0 16 3	1 12 6	1 19 0	2 5 6	2 12 0	2 15 3	2 18 6	3 5 0		13·0
14·0	0 14 0	0 17 6	1 15 0	2 2 0	2 9 0	2 16 0	2 19 6	3 3 0	3 10 0		14·0
15·0	0 15 0	0 18 9	1 17 6	2 5 0	2 12 6	3 0 0	3 3 9	3 7 6	3 15 0		15·0
16·0	0 16 0	1 0 0	2 0 0	2 8 0	2 16 0	3 4 0	3 8 0	3 12 0	4 0 0		16·0
17·0	0 17 0	1 1 3	2 2 6	2 11 0	2 19 6	3 8 0	3 12 3	3 16 6	4 5 0		17·0
18·0	0 18 0	1 2 6	2 5 0	2 14 0	3 3 0	3 12 0	3 16 6	4 1 0	4 10 0		18·0
19·0	0 19 0	1 3 9	2 7 6	2 17 0	3 6 6	3 16 0	4 0 9	4 5 6	4 15 0		19·0
20·0	1 0 0	1 5 0	2 10 0	3 0 0	3 10 0	4 0 0	4 5 0	4 10 0	5 0 0		20·0

READY RECKONER FOR FERTILISERS—*continued.*

%	£ s d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%
	0 5 6	0 6 0	0 7 0	0 7 6	0 8 0	0 8 6	0 9 0	0 9 6		
·1	0 0 7	0 0 7	0 0 8	0 0 9	0 0 10	0 0 10	0 0 11	0 0 11		·1
·2	0 1 1	0 1 2	0 1 5	0 1 6	0 1 7	0 1 8	0 1 10	0 1 11		·2
·3	0 1 8	0 1 10	0 2 1	0 2 3	0 2 5	0 2 7	0 2 8	0 2 10		·3
·4	0 2 2	0 2 5	0 2 10	0 3 0	0 3 2	0 3 5	0 3 7	0 3 10		·4
·5	0 2 9	0 3 0	0 3 6	0 3 9	0 4 0	0 4 3	0 4 6	0 4 9		·5
·6	0 3 4	0 3 7	0 4 2	0 4 6	0 4 10	0 5 1	0 5 5	0 5 8		·6
·7	0 3 10	0 4 2	0 4 11	0 5 3	0 5 7	0 5 11	0 6 4	0 6 8		·7
·8	0 4 5	0 4 10	0 5 7	0 6 0	0 6 5	0 6 10	0 7 2	0 7 7		·8
·9	0 4 11	0 5 5	0 6 4	0 6 9	0 7 2	0 7 8	0 8 1	0 8 7		·9
1·0	0 5 6	0 6 0	0 7 0	0 7 6	0 8 0	0 8 6	0 9 0	0 9 6		1·0
2·0	0 11 0	0 12 0	0 14 0	0 15 0	0 16 0	0 17 0	0 18 0	0 19 0		2·0
3·0	0 16 6	0 18 0	1 1 0	1 2 6	1 4 0	1 5 6	1 7 0	1 8 6		3·0
4·0	1 2 0	1 4 0	1 8 0	1 10 0	1 12 0	1 14 0	1 16 0	1 18 0		4·0
5·0	1 7 6	1 10 0	1 15 0	1 17 6	2 0 0	2 2 6	2 5 0	2 7 6		5·0
6·0	1 13 0	1 16 0	2 2 0	2 5 0	2 8 0	2 11 0	2 14 0	2 17 0		6·0
7·0	1 18 6	2 2 0	2 9 0	2 12 6	2 16 0	2 19 6	3 3 0	3 6 6		7·0
8·0	2 4 0	2 8 0	2 16 0	3 0 0	3 4 0	3 8 0	3 12 0	3 16 0		8·0
9·0	2 9 6	2 14 0	3 3 0	3 7 6	3 12 0	3 16 6	4 1 0	4 5 6		9·0
10·0	2 15 0	3 0 0	3 10 0	3 15 0	4 0 0	4 5 0	4 10 0	4 15 0		10·0
11·0	3 0 6	3 6 0	3 17 0	4 2 6	4 8 0	4 13 6	4 19 0	5 4 6		11·0
12·0	3 6 0	3 12 0	4 4 0	4 10 0	4 16 0	5 2 0	5 8 0	5 14 0		12·0
13·0	3 11 6	3 18 0	4 11 0	4 17 6	5 4 0	5 10 6	5 17 0	6 3 6		13·0
14·0	3 17 0	4 4 0	4 18 0	5 5 0	5 12 0	5 19 0	6 6 0	6 13 0		14·0
15·0	4 2 6	4 10 0	5 5 0	5 12 6	6 0 0	6 7 6	6 15 0	7 2 6		15·0
16·0	4 8 0	4 16 0	5 12 0	6 0 0	6 8 0	6 16 0	7 4 0	7 12 0		16·0
17·0	4 13 6	5 2 0	5 19 0	6 7 6	6 16 0	7 4 6	7 13 0	8 1 6		17·0
18·0	4 19 0	5 8 0	6 6 0	6 15 0	7 4 0	7 13 0	8 2 0	8 11 0		18·0
19·0	5 4 6	5 14 0	6 13 0	7 2 6	7 12 0	8 1 6	8 11 0	9 0 6		19·0
20·0	5 10 0	6 0 0	7 0 0	7 10 0	8 0 0	8 10 0	9 0 0	9 10 0		20·0

READY RECKONER FOR FERTILISERS—*continued.*

%	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%
	0 10 0	0 12 6	0 14 0	0 15 0	0 16 0	0 17 0	0 17 6	0 18 0		
·1	0 1 0	0 1 3	0 1 5	0 1 6	0 1 7	0 1 8	0 1 9	0 1 10		·1
·2	0 2 0	0 2 6	0 2 10	0 3 0	0 3 2	0 3 5	0 3 6	0 3 7		·2
·3	0 3 0	0 3 9	0 4 2	0 4 6	0 4 10	0 5 1	0 5 3	0 5 5		·3
·4	0 4 0	0 5 0	0 5 7	0 6 0	0 6 5	0 6 10	0 7 0	0 7 2		·4
·5	0 5 0	0 6 3	0 7 0	0 7 6	0 8 0	0 8 6	0 8 9	0 9 0		·5
·6	0 6 0	0 7 6	0 8 5	0 9 0	0 9 7	0 10 2	0 10 6	0 10 10		·6
·7	0 7 0	0 8 9	0 9 10	0 10 6	0 11 2	0 11 11	0 12 3	0 12 7		·7
·8	0 8 0	0 10 0	0 11 2	0 12 0	0 12 10	0 13 7	0 14 0	0 14 5		·8
·9	0 9 0	0 11 3	0 12 7	0 13 6	0 14 5	0 15 4	0 15 9	0 16 2		·9
1·0	0 10 0	0 12 6	0 14 0	0 15 0	0 16 0	0 17 0	0 17 6	0 18 0		1·0
2·0	1 0 0	1 5 0	1 8 0	1 10 0	1 12 0	1 14 0	1 15 0	1 16 0		2·0
3·0	1 10 0	1 17 6	2 2 0	2 5 0	2 8 0	2 11 0	2 12 6	2 14 0		3·0
4·0	2 0 0	2 10 0	2 16 0	3 0 0	3 4 0	3 8 0	3 10 0	3 12 0		4·0
5·0	2 10 0	3 2 6	3 10 0	3 15 0	4 0 0	4 5 0	4 7 6	4 10 0		5·0
6·0	3 0 0	3 15 0	4 4 0	4 10 0	4 16 0	5 2 0	5 5 0	5 8 0		6·0
7·0	3 10 0	4 7 6	4 18 0	5 5 0	5 12 0	5 19 0	6 2 6	6 6 0		7·0
8·0	4 0 0	5 0 0	5 12 0	6 0 0	6 8 0	6 16 0	7 0 0	7 4 0		8·0
9·0	4 10 0	5 12 6	6 6 0	6 15 0	7 4 0	7 13 0	7 17 6	8 2 0		9·0
10·0	5 0 0	6 5 0	7 0 0	7 10 0	8 0 0	8 10 0	8 15 0	9 0 0		10·0
11·0	5 10 0	6 17 6	7 14 0	8 5 0	8 16 0	9 7 0	9 12 6	9 18 0		11·0
12·0	6 0 0	7 10 0	8 8 0	9 0 0	9 12 0	10 4 0	10 10 0	10 16 0		12·0
13·0	6 10 0	8 2 6	9 2 0	9 15 0	10 8 0	11 1 0	11 7 6	11 14 0		13·0
14·0	7 0 0	8 15 0	9 16 0	10 10 0	11 4 0	11 18 0	12 5 0	12 12 0		14·0
15·0	7 10 0	9 7 6	10 10 0	11 5 0	12 0 0	12 15 0	13 2 6	13 10 0		15·0
16·0	8 0 0	10 0 0	11 4 0	12 0 0	12 16 0	13 12 0	14 0 0	14 8 0		16·0
17·0	8 10 0	10 12 6	11 18 0	12 15 0	13 12 0	14 9 0	14 17 6	15 6 0		17·0
18·0	9 0 0	11 5 0	12 12 0	13 10 0	14 8 0	15 6 0	15 15 0	16 4 0		18·0
19·0	9 10 0	11 17 6	13 6 0	14 5 0	15 4 0	16 3 0	16 12 6	17 2 0		19·0
20·0	10 0 0	12 10 0	14 0 0	15 0 0	16 0 0	17 0 0	17 10 0	18 0 0		20·0

READY RECKONER FOR FERTILISERS—*continued.*

%	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%
	0 19 0	1 0 0	1 1 0	1 2 0	1 3 0	1 4 0	1 5 0	1 10 0		
·1	0 1 11	0 2 0	0 2 1	0 2 2	0 2 4	0 2 5	0 2 6	0 3 0		·1
·2	0 3 10	0 4 0	0 4 2	0 4 5	0 4 7	0 4 10	0 5 0	0 6 0		·2
·3	0 5 8	0 6 0	0 6 4	0 6 7	0 6 11	0 7 2	0 7 6	0 9 0		·3
·4	0 7 7	0 8 0	0 8 5	0 8 10	0 9 2	0 9 7	0 10 0	0 12 0		·4
·5	0 9 6	0 10 0	0 10 6	0 11 0	0 11 6	0 12 0	0 12 6	0 15 0		·5
·6	0 11 5	0 12 0	0 12 7	0 13 2	0 13 10	0 14 5	0 15 0	0 18 0		·6
·7	0 13 4	0 14 0	0 14 8	0 15 5	0 16 1	0 16 10	0 17 6	1 1 0		·7
·8	0 15 2	0 16 0	0 16 10	0 17 7	0 18 5	0 19 2	1 0 0	1 4 0		·8
·9	0 17 1	0 18 0	0 18 11	0 19 10	1 0 8	1 1 7	1 2 6	1 7 0		·9
1·0	0 19 0	1 0 0	1 1 0	1 2 0	1 3 0	1 4 0	1 5 0	1 10 0		1·0
2·0	1 18 0	2 0 0	2 2 0	2 4 0	2 6 0	2 8 0	2 10 0	3 0 0		2·0
3·0	2 17 0	3 0 0	3 3 0	3 6 0	3 9 0	3 12 0	3 15 0	4 10 0		3·0
4·0	3 16 0	4 0 0	4 4 0	4 8 0	4 12 0	4 16 0	5 0 0	6 0 0		4·0
5·0	4 15 0	5 0 0	5 5 0	5 10 0	5 15 0	6 0 0	6 5 0	7 10 0		5·0
6·0	5 14 0	6 0 0	6 6 0	6 12 0	6 18 0	7 4 0	7 10 0	9 0 0		6·0
7·0	6 13 0	7 0 0	7 7 0	7 14 0	8 1 0	8 8 0	8 15 0	10 10 0		7·0
8·0	7 12 0	8 0 0	8 8 0	8 16 0	9 4 0	9 12 0	10 0 0	12 0 0		8·0
9·0	8 11 0	9 0 0	9 9 0	9 18 0	10 7 0	10 16 0	11 5 0	13 10 0		9·0
10·0	9 10 0	10 0 0	10 10 0	11 0 0	11 10 0	12 0 0	12 10 0	15 0 0		10·0
11·0	10 9 0	11 0 0	11 11 0	12 2 0	12 13 0	13 4 0	13 15 0	16 10 0		11·0
12·0	11 8 0	12 0 0	12 12 0	13 4 0	13 16 0	14 8 0	15 0 0	18 0 0		12·0
13·0	12 7 0	13 0 0	13 13 0	14 6 0	14 19 0	15 12 0	16 5 0	19 10 0		13·0
14·0	13 6 0	14 0 0	14 14 0	15 8 0	16 2 0	16 16 0	17 10 0	21 0 0		14·0
15·0	14 5 0	15 0 0	15 15 0	16 10 0	17 5 0	18 0 0	18 15 0	22 10 0		15·0
16·0	15 4 0	16 0 0	16 16 0	17 12 0	18 8 0	19 4 0	20 0 0	24 0 0		16·0
17·0	16 3 0	17 0 0	17 17 0	18 14 0	19 11 0	20 8 0	21 5 0	25 10 0		17·0
18·0	17 2 0	18 0 0	18 18 0	19 16 0	20 14 0	21 12 0	22 10 0	27 0 0		18·0
19·0	18 1 0	19 0 0	19 19 0	20 18 0	21 17 0	22 16 0	23 15 0	28 10 0		19·0
20·0	19 0 0	20 0 0	21 0 0	22 0 0	23 0 0	24 0 0	25 0 0	30 0 0		20·0

THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Government Botanist.

No. 34.

A "RATTLE POD" (*CROTALARIA STRIATA*).

Description.—A woody erect branching undershrub of 2-4 ft. high, the young branches densely silky hairy. Leaves trifoliolate (composed of three leaflets), petiole (leaf-stalk) 1-2 in. long, leaves obovate or obovate-oblong, the central one the largest 1½-2½ in. long, ¾-1½ in. broad, all on petiolules (stalklets) of 1 line. Flowers in long terminal racemes of 6 in. to over 1 ft. according to the stage of development. Bracts subtending the flowers hairy, linear-setaceous, 2-3 lines long, very deciduous. Pedicels (flower stalks) 1-1½ lines long, covered with rather long silky hairs. Calyx about 3 lines long, densely silky hairy, the lobes lanceolate, acuminate equalling or the lower lobes slightly exceeding the tube. Corolla yellow streaked with dark lines, about ½ in. long. Pod 1½ in. long, ¾ in. broad, cylindrical with a deep central furrow when ripe; seeds varying from a light straw colour to a deep brown, kidney-shaped, about 1 line long and 30-40 seeds in a pod.

Distribution.—A common weed over most of the tropics; a native of Tropical Asia, Africa, and America, but no doubt introduced into Australia and the Pacific.

Common Name.—This and other members of the genus go under the name of "Rattle Pod," due to the dried pods with their seeds making a rattling noise when shaken.

Botanical Name.—*Crotalaria*, from the Greek *krotalon*, a rattle, in reference to the rattling noise made by the seeds in the dry pod when ripe; *striata* (Latin) meaning fluted.

Poisonous Properties.—This plant has several times been suspected in Queensland of causing losses amongst stock and the genus is a dangerous one containing, in other parts of the world, plants known definitely to be poisonous to stock—*e.g.*, *C. Burkeana* (Stiffzeikte bosje) in South Africa and *C. sagittalis* (Rattle Box) in North America. In the "Report of the Administrator of the Northern Territory" for the year 1922, Pt. XIV., pp. 133-134, the Chief Veterinary Officer, Mr. J. C. Lewis, gives some results of feeding tests carried out with this plant.* He states—"From time to time numerous deaths occur among the herds of goats, particularly the younger animals, due to their eating portions of either ironwood or the indigo plant, but it rarely happens that the fatalities are among the older goats, or that any number become poisoned at or about the same time, for the harmful nature of the plants is probably early recognised by the animals.

Where many deaths occur at or about the same time it can generally be taken that, if not due to an infectious disease, the animals have suddenly had access to a poisonous plant not previously encountered. Instances, however, do occur where perverted appetite or a desire for a change leads an animal to sample some poisonous bush, and the example is soon followed by others.

This is probably the explanation of the outbreaks of poisoning seen among herds of goats due to a plant which for years they have passed by, and for which a sudden fancy is developed. Nine goats among a herd at the Botanic Gardens died one night without showing any previous symptoms, having been shut up in good health the evening before. Examination at the post-mortem which I held next day, together with the history of the cases, pointed to a probability of vegetable poison being the cause of the fatalities, the suspicion being strengthened by the finding of varying amounts of leaves and pods of a certain plant in the rumen of all the goats examined.

The summary of feeding experiments carried out on five goats is as follows:—Two to three ounces of the fresh leaves in bolus form are sufficient to produce death within twenty-four hours, the longest period being twenty-three and a-half hours, the shortest about eight hours, when three ounces of leaves were used.

With smaller quantities symptoms are delayed, but not prolonged. The continued feeding of very small quantities have not been carried out for long periods, so that the effect cannot be stated.

* The species is referred to under the name of *Crotalaria arborea*, a name, however, I cannot trace in botanical literature. From the excellent plate (Plate XIV.) accompanying the article, however, there is no difficulty in determining the plant as the widely distributed *C. striata*. I am indebted to Mr. J. Legg, B.V.Sc., M.R.C.V.S., for the reference to Mr. Lewis's report.

Plate 61.—A "Rattle Pod." (*Crotalaria striata*). Poisonous to Stock.

It was considered that if the plant were eaten at all, owing to its highly toxic nature, much more than the amount sufficient to cause death would probably be ingested.

Symptoms are not at all well marked, especially when large quantities are eaten, the onset being rarely more than half an hour before death. A straggling gait is first noticed, disinterestedness in surroundings and then inability to stand. A comatose condition with widely dilate pupil precedes death, which takes place without struggling. Respiration ceases prior to cessation of the heart beats.

The post-mortem appearance of animals experimentally fed corresponded closely to those observed in the first goats examined with the exception that, if anything, those in experimental cases were not so severe, probably on account of the fact that much more of the plant was eaten by the goats not fed artificially. In the thorax the most noticeable lesion is a large quantity of pleuritic fluid, also an increased amount in the pericardial cavity. The lungs show numerous hæmorrhagic areas, particularly at the free margins.

The appearance of the heart is normal, apart from the prominent and engorged subepicardial capillaries.

With the abdominal organs, the noticeable condition is one of congestion, the liver being swollen and bleeding freely from the cut or torn surfaces. The kidneys seem to be enlarged and congested with points of hæmorrhage beneath the capsule.

Though some increase in the amount of peritoneal fluid may be present, ascites is not well marked.

On opening the rumen and removing the internal desquamated layer of the mucous membrane, large areas of the papillæ are seen of intense redness. These appeared to be more marked where quantities of the plant lay against the rumen wall. Speaking generally the greater the amount of Crotalaria the rumen contained the greater and more intense the lesions on the papillæ.

Microscopical examination of the organs revealed a well-marked congestion of the liver and kidneys. In the liver much of the lobular structure is lost by blood extravasation, while the vessels are enormously distended.

In the kidneys, the extravasations of blood are confined principally in the medullary portion of the gland. Vessels in this portion cut tranversely showed besides engorgement swelling and desquamation of the endothelium. The glomeruli vary little from the normal in appearance.

Taking the post-mortem appearances as a whole and the conditions revealed on microscopic examination, the lesions point clearly to the poison acting principally on the endothelium of the blood vessels. The poisonous principle of the Crotalaria, though not isolated, can thus be put down as an endothelial poison.

The poisonous quality is lost when the plant is cut and dried. This was particularly noticeable during the feeding experiments. Though the plant was cut at flowering period, unless within a few hours after cutting, no results could be obtained from the administration of the leaves in bolus form.

Economic Uses.—The bark like that of other members of the genus contains a strong fibre, but it is not likely that under Australian conditions it will prove of commercial value. The plant is widely grown in the tropics as a green manure and as a cover crop for smothering weeds. In this latter respect Messrs. Kelway Bamber and J. A. Holmes, writing in the "Circulars and Agricultural Journal of the Royal Botanic Gardens, Ceylon," vol. v. No. 17, state—"The plant is very common in Ceylon from sea-level to 4,000 ft. Several experiments have been made both growing it alone and in various crops. It yields heavily and when grown alone has given 14¼ tons of stalk and leaf and 5¾ tons of root residue per acre in one cutting. If cut before flowering and not too low it will give up to four cuttings in a season, provided good growing weather is experienced. Planted in an acre of tea in alternate lines the total yield obtained in three cuttings for mulching purposes was 20,827 lb.

In the same Journal, vol. 3, No. 12, Herbert Wright, writing on green manures, states that analysis shows the plant to contain 0.73 to 0.991 per cent. of free nitrogen in the fresh state, and 3.8 per cent. in the dried material. This means that a green crop, 1 ton in weight, contains about 20 lb. of nitrogen. In summing up the advantages and disadvantages on Crotalaria and comparing them with those of cowpeas he recommends *Crotalaria striata* as the more suitable plant for tea owing to its upright habit and the stems not twining round the tea bushes, but favours cowpeas for cocoa and coconuts. For general use in Australia the plant, as a green manure, would probably find its greatest use in improving some of our poor sandy coastal lands.

Botanical Reference.—*Crotalaria striata* De Candolle Prodromus, 2, 131.

COTTON CULTIVATION IN QUEENSLAND.

By W. G. WELLS, Cotton Specialist.

Ever since 1858 there have been spasmodic attempts to develop a cotton-growing industry in Australia, and particularly in Queensland, but with the exception of a short period when a total area of 14,000 acres was developed in about 1870, it cannot be said that the industry has flourished to any marked degree until within the last few years.

In 1919, owing to the growing scarcity of cotton, the Government of Queensland determined to make an extreme effort to put the cotton-growing industry in this State on a permanent basis and in order to accomplish this aim guaranteed to the growers a price of 5½d. per lb. for all seed cotton of good quality.

This guarantee has greatly stimulated the development of the cotton-growing industry, as is shown in the following table of acreages since 1913:—

—	Acreage.	Yield of Seed Cotton (lbs.)	Net Returns paid to Farmers per lb.	Total Value of Crop.
			d.	£
Queensland cotton 1914 ..	134	20,336	1·13	209
„ „ 1915 ..	72	12,238	2·537	128
„ „ 1916 ..	75	24,264	2·537	253
„ „ 1917 ..	133	118,229	3·58	1,764
„ „ 1918 ..	203	166,458	4·35	3,017
„ „ 1919 ..	73	37,238	5·5	853
„ „ 1920 ..	166	57,065	5·5	1,308
„ „ 1921 ..	1,967	940,125	5·5	21,544
„ „ 1922 ..	7,000	3,876,677	5·5	88,466

On 4th September the amount of seed cotton received at the ginneries amounted to 11,300,000 lb., of a value to the growers of £253,000.

ADVANTAGES OF COTTON GROWING.

The cotton-growers of the last two seasons have found that cotton-growing in most of the districts of Queensland is a valuable asset to the dairying or maize-growing industries.

Valuable Asset.

Not only is growing cotton a valuable asset in seasons of favourable climatic conditions, but also owing to the ability to withstand moderately droughty conditions it is of great assistance as a revenue producer in periods of drought unfavourable to producing profitable crops of maize or other farm products.

Grow Five to Ten Acres.

The experiences of many farmers who have attempted cotton-growing in conjunction with either of these industries indicate that the average farmer can easily grow from 5 to 10 acres of cotton without employing any extra labour, with the possible exception of short periods during the picking season.

Net Profits per Acre.

Men with medium-sized families have found that they could do all of the labour in connection with the growing of 5 to 10 acres of cotton, and for the results of their efforts received practically net returns of from £20 to £40 per acre and in several cases even higher results.

Children can Pick.

Owing to the period of cotton picking occurring during the cooler seasons it is no hardship for the children to assist in the picking on holidays and after school hours, and thereby earn their spending money or assist in increasing the family's resources.

Limit your Acreage and Grow Good Cotton.

It is not considered advisable for the growers to attempt larger acreages than 10 to 15 acres until they become more familiar with the operations connected with cotton-growing. It is far better for the future of the cotton-growing industry of Queensland if the acreage under production each year is limited to only what will produce the highest quality and grade of cotton, rather than to have a big expansion of the acreage which will mean the production of cotton of mediocre or inferior quality and grade.

THE NECESSITY FOR PURE STRAINS OF VARIETIES OF COTTON.

Pure Varieties being Bred.

The Department of Agriculture and Stock realises the necessity of developing the cotton-growing industry on lines based on the production of only the highest quality of uniform pure varieties of cotton of the types which are in demand by the fine spinners of the world. Pure

varieties of these types have been introduced from the United States, and experiment stations are being developed where these varieties can be carefully selected and bred to suit the requirements of the various sections of the cotton-growing districts.

Community Cotton.

The experiences of the other cotton-growing countries of the world, particularly in Egypt and in the United States, show the absolute necessity of placing a cotton-growing industry on a one or "community" variety basis. This is not only of advantage in maintaining the purity of any cottons which may be found the most suitable to the various climatic and soil conditions of a country, but is also of marked assistance in the marketing of the crop to its fullest value.

Advantages of One Type.

Localities which grow only the one type of uniform cotton year after year soon become known to the cotton trade for their reliability of types, and the buyers are willing to even pay premiums over the average market in order to secure such uniform cottons.

SOILS.

Plenty of Suitable Land.

There are many types of soil in Queensland which appear to be suitable to cotton-growing, even under severely droughty conditions, and under normal seasonal conditions there are probably sufficient acreages to meet the expansion of the cotton-growing industry until it reaches a state of development which will require a population very much in excess of that of Queensland at present.

Undesirable features may be discovered in some of these soils after they have been cropped to cotton for several years; but, for the present, the following soils seem to be well suited to cotton-growing:—

Southern District.

Alluvial creek deposits, sandy loams, apple-tree flats (especially in the South-Western districts), light loams of a foot or 2 feet in depth overlying heavy subsoils (particularly along the coastal area), and the heavy brown loams between the sea and the main range (Toowoomba).

Central District.

The alluvial creek deposits in this district have been found to produce very good yields of good quality cotton of the length and type of staple of which there is the most scarcity. Fortunately, there are large acreages of these soils in this district, and eventually there should be a considerable amount of fine cotton grown in this section. The soft-wood scrub red and grey soils have also produced excellent crops of good quality. In years of good winter rainfall with opportune spring rains

the heavy black soils may be expected to produce heavy yields of cotton, but it is pointed out that the difficulties of obtaining a stand under droughty conditions are more numerous than in the softer soils.

Northern District.

There has not been sufficient cotton grown in the Northern District to thoroughly demonstrate the possibilities of that section. In sections of medium rainfall the sandy loams of the river flats have produced very good staples and over a series of years would probably produce better cotton than the heavy or hilly soils. In the heavy rainy belts it is deemed advisable to experiment with the open and lighter soils in order to check too rank a growth of the plant.

Fertile Soils Advisable.

With the exception of the districts receiving high amounts of rainfall during the growing season, it is advisable to grow cotton on the more fertile soils. The poorer soils may produce cotton in fairly large quantities per acre, but cotton on such soils is more subject to the influences of the climatic changes and may not be of the same constant quality over a series of years as the cotton grown on the richer soils.

This is a very important point, as the spinner is looking for a continuity of supply of the one type of cotton in order that he can feel assured of securing the same type of cotton year after year.

PREPARATION OF SEED BED.

Thorough Prepared Seed Bed Necessary.

The experiences of the cotton-growers of this season (1922-23) under the conditions of severe drought which have existed clearly indicate the necessity of thoroughly preparing the seed bed before planting. In nearly every district the application of modern methods of dry farming have secured results which show that, even under conditions of very severe drought, good yields of cotton may be obtained if the proper methods of farming are utilised.

Early Preparation Advisable.

A large percentage of the development of the cotton industry is taking place in the newer sections of the country and much of the acreage devoted to cotton-growing is of soil being broken for the first time. Consequently, it is of the utmost importance to establish the best of tilth on such soils before planting a crop. Early ploughing after the rainy season, followed by sufficient harrowings to destroy the growths of weeds and conserve moisture, with a cross ploughing of a depth of 6 to 7 inches at least six weeks before planting, should be the rule for new land throughout most of the Southern and Central districts of Queensland.

Ploughing of Grass Sod.

It appears desirable to plough somewhat shallow in grass-sod land, as this allows the roots to be exposed on the surface during the dry winter months, which is of assistance in killing and decomposing them. By thoroughly harrowing such sod before the latter cross ploughing, the upper surface is reduced sufficiently to allow the preparation of a

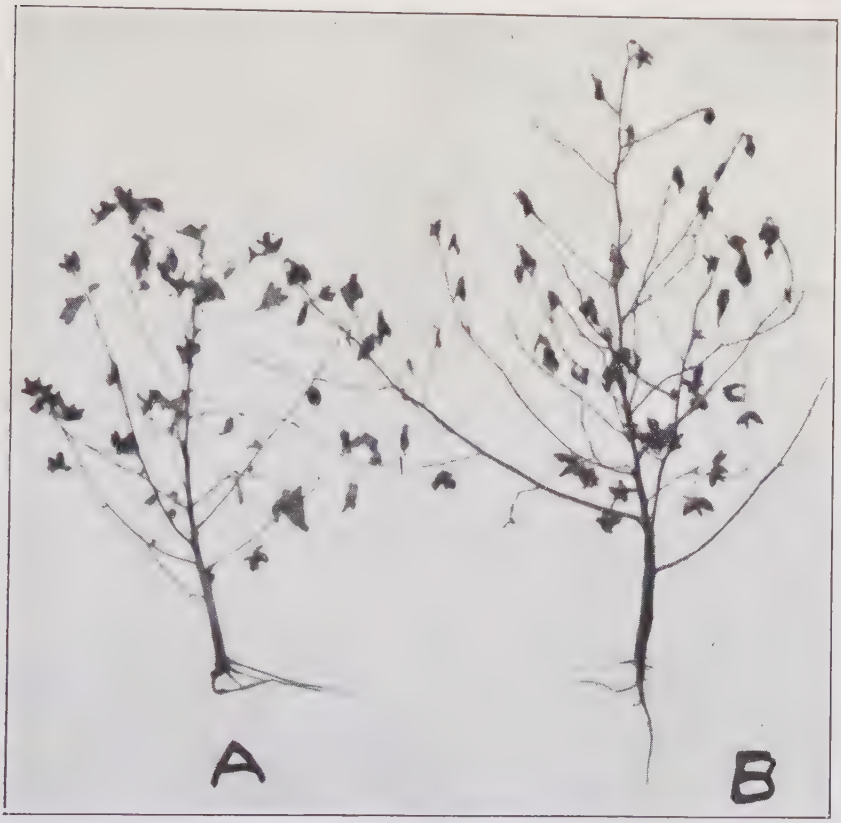


Plate I.—Showing the Development of the Root System of a Cotton Plant.

A. Grown on a poorly-prepared seed bed.
B. Grown on a well-prepared seed bed.

firm, mellow seed bed after the cross ploughing has been done. Winter rains should always be followed by a good harrowing to conserve the moisture. It is believed that seed beds prepared under such methods will have sufficient moisture under normal conditions to insure the development of the young seedlings after they have become established.

Removal of Old Stalks.

In preparing the seed bed following a crop of cotton the problem presents itself as to how to remove the old cotton stalks. Some method of ploughing out the whole stalk is advisable, as the field can then be

raked and burned, thereby destroying all trash and also any remaining seed cotton—an important item in preserving the purity of the new crop. This would also assist in destroying any bacterial or fungoid diseases and any insect pests which may be in the unopened top crop of bolls at the time of ploughing, especially in districts where frosts do not occur.

It is pointed out that if the stalks are ploughed under the above advantages are lost, and also owing to the lack of general winter rains the seed bed will not be able to settle firmly, thereby increasing the difficulties of securing a moist seed bed which will carry the young plant over the dry periods of the spring months.

TIME TO PLANT.

Early Planting.

When to plant has been the subject of much discussion this last season, but from the results secured and from the experiences of the cotton-growers in the United States, it appears desirable to plant as soon as there is sufficient moisture and warmth in the soil to ensure a rapid germination and development of the seedlings. It is pointed out, though, that the time of planting should not be so early as to subject the young plants to cold night temperatures, as such conditions, while the plants might not be subjected to frosts, are conducive to checking the development of the young plants, in which case such diseases as "sore-shin" or "damping off" often occur with a resulting mortality in the ultimate "stand" secured.

September and October.

In most of the sections of Southern and Central Queensland the proper conditions for planting will probably occur in September and October. The temperatures are not very high at that season of the year and the evaporation of the soil moisture is therefore small, so that in a well-prepared seed bed with a moist subsoil and surface soil a light rain will establish sufficient moisture to germinate the seed. This is generally before the summer grass seedlings sprout, which enables the young cotton plants to become thoroughly established and also allows the grower to prepare a good surface mulch as soon as the rows of young plants can be seen.

Exceptions to Early Planting.

There are sections in the Coastal and in the Northern Districts especially where it may not be advisable to plant in the early months, as the first bolls of such crops might open in the rainy period, in which case there is a probability that the grade of the lint cotton might be lowered and in some cases part of the crop destroyed. In similar sections in the Southern and Central Districts it may be advisable to delay the time of planting until the first part of November, which should delay the opening of the crop until after the rainy season. There is danger, though, at this time of the year, of the young seedlings being "burnt off"

by severe hot winds, especially if the seed has been planted too deeply so as to delay the appearance of the young leaves above the ground, or if there is insufficient moisture in the upper surface of the seed bed.

Planting in Northern Districts.

There is no clear evidence as when to plant in the Northern districts. Some growers advocate planting in late December just before the heavy rains start, while others advocate waiting until the rains are nearly over before planting. The disadvantage of planting in December is that continuous wet weather may set in before the crops are properly cultivated, in which case difficulty might be experienced in coping with the weeds. The plants would have a tendency to grow very rankly and possibly at the expense of the development of the crop. On the other hand, the growers waiting until the rains are nearly over may experience the difficulty of being delayed in their planting until the season is so far advanced that the plants are delayed in the ripening of the crop of bolls by the cool night temperatures. Carefully conducted experiments are necessary to determine the proper time of planting in such districts, and the Department is at present investigating the points in question.

Dry Planting.

Some growers in the Southern Districts this season have secured very good results by getting their seed bed in good condition and then planting it in the dry dirt—their idea being that they would thus be able to obtain the advantage of any light local showers supplying sufficient moisture in the upper surface to ensure germination of the seed. The danger of this practice is that the germination of the seed may be delayed, through lack of rains, to such an extent that the weeds and grass may get so far advanced that the young seedlings will be choked out when they attempt to come through the surface soil.

Methods of Good Farming are Necessary.

It is brought out at this point, that unless the grower is going to apply the best methods of farming in growing his crop of cotton, that he need not expect to receive highly profitable crops. It is true that under very favourable soil and climatic conditions some of the growers of two years ago received very large yields from crops which had been badly neglected by the growers leaving them from the time of planting to the time of harvesting. These results gave rise to the opinion that cotton could be grown under very poor methods of farming, but the growers who have tried such methods under the droughty conditions which have existed this year, have been sadly disillusioned, and now thoroughly realise that the best methods of farming are absolutely essential in the production of a profitable crop of good quality cotton.

There are many qualities of lint which may be in a well-opened boll of cotton. Because the crop has large well-opened bolls is no criterion that the quality will be the best. The methods of farming determine the

quality, and the distances between Australia and her world markets for cotton demand that the methods of farming be such as to produce only the best qualities.

HOW TO PLANT.

Necessity for an even Germination.

Many methods of planting have been devised this year, all of which have succeeded under the proper soil and moisture conditions. All of these methods are open to criticism in that they do not ensure an even depth of planting; and in many cases in this season, in parts of the row, the seed has been planted too shallow or too deeply, resulting in an uneven germination which has handicapped the grower in that the planted rows were not sufficiently defined, when the plants were in the seedling stage, to allow an early cultivation being made. This is a very important factor—the securing of an even germination, and the grower should exercise care in getting the seed planted at the same depth, the proper depth being 2 inches in moist soils. Any serious delay in cultivating the early crop often allows the weed growth to check the development of the young plant, or necessitates the incurring of considerable expense in employing hand labour. This is especially true in regard to late planted crops. An uneven germination is also a handicap at thinning time, as the plants being of different heights and stages of development will not all be thinned at the proper stage.

Furrow Planting.

Many of the growers of this past season who have been growing their first crop of cotton did not feel warranted in incurring the expense of purchasing a cotton planter, and planted their crops by ploughing out shallow furrows, dropping the seed by hand, and then covering the seed with a drag harrow. This method has often given very good results, but it is pointed out that a well-prepared seed bed should first be established well in advance of the planting time before using this system, and that small acreages have given the best results.

Dangers of Furrow Planting.

This is somewhat of an expensive system unless the regularly employed labour can be utilised, and there is also the danger of the soil drying out too quickly before the seeds are covered. It is suggested where this system is employed that the seed be dropped and covered immediately behind the furrowing plough so as to reduce the loss of moisture.

Soaking Planting Seed.

It may be advantageous to soak the seed in warm water for several hours before planting by this system as this would hasten the germination. It is necessary, though, not to have the water sufficiently hot to destroy the germ, or, to delay the planting after soaking the seed. It is not believed advisable to plant soaked seed in dry ground, as the seedlings will sprout and then die before making contact with the lower moistures sufficiently to enable them to come through the surface.

Methods of Treating Seed for Planting.

Unfortunately, in this country, most of the machinery for planting maize is not supplied with attachments suitable for planting cotton seed as it is received from the gin. The short fuzz which adheres to the seed interferes with an even distribution, and it has been found necessary to prepare the seed so as to enable it to distribute more freely. This has been accomplished in several different ways. Puddled clay or a very thin flour paste is often used, the seed being dipped into the mixture and then rolled to ensure even distribution of the coating. The rolling may be accomplished by putting the treated seed in a hessian sack and rolling the seed from one end of the sack to the other until smooth. The seed should be dried quickly in the sun. When rolling the seed which has been dipped into the flour paste, it is advisable to put some wood ashes in the sack in order to ensure thorough separation of the seed.

Singeing.

The fluff on the seed may be singed by passing the seed through a hollow burning log into a tub of water. The seed should be removed immediately from the water and dried in order to prevent the soaking of the seed, which is undesirable when using a machine to plant as the seed may be cracked in passing through the seed plates.

Dangers of these Methods.

The danger of all these methods is that the coating applied to the seed may be too hard to allow the young seed leaves to expand when they are through the ground, which would stop the growth of the young plant. Several instances were noticed of this occurring this past season, and it is pointed out that the coating should be only as thick as is necessary to accomplish the desired effect on the seed.

Several implement firms are investigating the possibilities of securing machines suitable for either cotton or maize planting, and it is anticipated that reliable makes of machines will soon be on the market. These will be of great assistance to the growers in quickly planting their acreage after any spring rains—an important point in seasons of light showers.

Rate of Planting.

During the past season 10 lb. of seed to the acre has been the recommended rate of sowing, but from the results secured it appears advisable to increase the rate to at least 15 lb. to the acre. In the United States, after years of experience and experimenting, it is the custom to plant 20 lb. to the acre, and many authorities advocate even more.

A Good Stand is Necessary.

Plenty of seed in a properly prepared moist seed bed is the cheapest form of insurance of securing a good stand. Without a good stand the grower is handicapped in obtaining the maiximum yields which his soils are capable of producing, no matter how carefully he may grow the crop.

Good Seed Available.

Only the seed from the districts which received the best rainfalls is being reserved for planting purposes. Numerous germination tests have been made to ascertain the percentage of germination, and it is believed that the best seed available is being distributed. However, as an extra precaution the rate of sowing should be somewhat liberal.

SCRUB PLANTING.

The consensus of opinion of the growers who have had experience in planting in the burnt-off scrub lands, is that the hand maize planter gives the best results. Treated seed is used, and the average machine drops four to six seed per hill. When spacing the hills about 2 feet apart in the row and 5 feet between the rows, a man is capable of planting 3½ to 4 acres per day.

SPACING BETWEEN ROWS.

No Fixed Rule.

The distance between the rows is a problem of which there is not sufficient evidence to arrive at a definite decision. Different soils and climatic conditions require different spacings of the rows and the plants in the rows. A spacing which may give the best results in one season may not do nearly as well in another season of a different rainfall, even on the same piece of land. For this reason, no definite rules of distances of spacing should be made. It is strongly urged that the grower experiment on his own soils and be guided by the results secured. It is pointed out, though, that such data as the uniformity and percentage of the stand, dates of planting, &c., should be accurately collected before arriving at any definite decisions, as any discrepancies in such data may influence the arrival at inaccurate conclusions.

Rich Alluvial Soils of Coastal Belts.

As a general rule, it is believed that for the rich alluvial soils in the coastal belts, plenty of distance should be allowed between the rows, and most growers agree that distances of 4½ to 5 feet are preferable. These distances may appear somewhat wide under droughty conditions such as occurred in this last season, but under such a variable climate as of the coastal belt of Queensland, it is necessary to allow for the rainy seasons when such wide distances will be required.

Dangers of Over-growth.

Most of the alluvial soils are very fertile, and under a season of good rains, the plants show a tendency to make a rank growth. Unless the rows are of sufficient distance apart to allow the sunlight to penetrate to the lower sections of the plants, there is danger that the lower bolls may rot from fungoid diseases caused by the excessive shade and conditions of humidity.

Alluvial Soils in Drier Belts.

In the districts away from the coast, a distance of 4 feet between the rows may be of sufficient width, although on the alluvial creek flats it may be wiser to allow 4½ feet.

Minimum Spacing of Rows.

It is not recommended that the rows be spaced less than 4 feet apart, as it may be advisable to cultivate between the rows late in the season, if the weed or grass growth is excessive, in which case matured plants in rows less than 4 feet apart might be developed to such an extent as to preclude a possibility of a horse being worked in the cotton without doing severe damage to the branches.

Picking Difficulties.

In seasons of excessive rainfall, there would probably be some difficulty experienced by the pickers in progressing through rows spaced less than 4 feet apart. In the season of 1921-22 several instances were reported of the plants interlapping to such an extent that it was difficult to ascertain from a distance the direction of the rows.

Scrub Lands.

Widths of 4½ to 5 feet between the rows has been the general custom in planting in the scrub lands.

PROPER TIME FOR THINNING.

Early Thinning.

The results secured by the growers this past season seem to indicate that the early planted cotton should be thinned when the plants are about 6 to 7 inches tall. The plants are well established then if growing in well prepared, moist seed beds, and by "chopping" to the desired stand the plants are allowed to develop into a thick stalked blocky type with a good rooting system, which is conducive to the early formation of fruiting branches.

Results of Late Thinning.

Many of the growers of this past year delayed the thinning until the plants were 12 to 14 inches tall, with the result that a slender whip-like type of plant was produced which failed to produce a lower crop of bolls. By delaying the thinning not only did the lower crop of bolls fail to develop, but the supply of soil moisture was also seriously diminished, and in some instances to such an extent that the development of the plants remaining, after the thinning, was greatly retarded and in some cases with severe results owing to the lack of rainfall at critical periods. This is of the utmost importance, as it is highly desirable that the young plant receive every assistance in becoming thoroughly established in the lower soils before the arrival of the period of hot temperatures, prior to the usual rainy season.

Thinning Late Planted Crops.

It may be advisable to delay the thinning until the plants are somewhat taller in the case of late planted crops, which will arrive at the time of thinning just prior to the usual time of the occurrence of the rainy season. Late planted cotton has the tendency to grow very rapidly under conditions of excessive moisture, and it is possible that by

delaying the thinning until the plants are about 10 inches tall that the growth will be restricted somewhat, and, after thinning, the plants will set a crop more quickly than is the case of an early thinned, rank-growing plant. There is no real evidence on the subject in this country, although it has been found to be somewhat true in the United States. It is advisable that the growers experiment with both methods where it is necessary to plant in the latter part of November or in December.

Time the Thinning Operations Properly.

Judgment should be exercised as to when to commence the thinning operations. If the available labour is such that the field can be completed within a week, it is advisable to wait until the plants are of the proper height for thinning. If the proper amount of labour cannot be obtained, it is advisable to start when the plants are from 5 to 6 inches in height in order that the plants will not be too tall and slender when the chopping is completed. A few days' wages paid to a man at this stage may mean a saving of considerable importance later, for not only are the cotton plants growing, but the weeds and grass may be also, and thereby be sapping the young cotton plants.

HOW TO THIN.

Use the Hoe.

Many of the growers of the past season have been of the opinion that the thinning should be done by hand. This is a very expensive, tedious, back-breaking operation and not at all necessary. With a well-balanced sharp hoe of about 7 inches in width, unless the soil is very foul with weeds and grass, or the plants allowed to grow too tall, a man can chop out an acre of cotton a day.

Advantages of Hoe Thinning.

This is not only less expensive than thinning by hand, but it is also more desirable, as two operations are performed at once—the young cotton plants which are not required are removed without disturbing the lower soils around the roots of the remaining plants, and the weed and grass seedlings are also removed. Both of these points are important, as the disturbing of the lower soils and quite often the root systems themselves, by hand thinning, allows the moisture to evaporate at a period in the development of the young plant when all available moisture should be conserved, and the destroying of the weed and grass seedlings allows the young cotton plants to develop without restriction.

Leave Healthy Plants.

Care should be exercised in leaving only healthy, normal plants whenever possible. It will be noticed upon examination, that often the cotton plant loses its main stalk when quite small, and two branches are developed from near the bottom to take its place, giving the plant a forked appearance. This type should not be left if possible of avoidance, as it has the tendency to develop a large bushy habit of growth at the expense of the lower fruiting branches, which reduces the amount of the lower crop of bolls.

Sharpen the Hoe.

In chopping with a hoe, the edge should be kept sharp, as it ensures a clean cutting off of the plant and also reduces the amount of effort necessary to accomplish the work.

Chop Close to the Ground.

Care should be exercised to cut the plant off at the surface of the ground in order to be below the pair of seed leaves—the first leaves to appear. By chopping the plant off below these leaves the plant will be killed, whereas by cutting above the seed leaves the plant will develop into the undesirable forked type.

DISTANCE TO THIN.

Determining Factors.

There are no reliable data as regards the proper distances to thin cotton in Queensland. As in the spacing of the rows, the different soil and climatic conditions are the governing factors. The determination of a distance which will give the best results under the most variable conditions should be the aim of each grower, and it is strongly recommended that each grower experiment with different distances in order to learn the requirements of his particular soil or soils. A distance which may be suitable for one section of his field may be unsuited for securing the best yields in another section of the same field, so that it is necessary for each grower to know his soils in order to secure the most profitable yields.

Suggested Distances.

There are certain generalisations which may be made, though, based on the results secured by the growers this year. It appears highly important to allow ample distance between the plants, under droughty or semi-droughty conditions, in order to supply the maximum amount of available moisture. This distance will vary under different soil conditions, but for the inland districts with annual rainfalls of 30 inches or less, it is suggested that distances from 15 to 20 inches apart be tried until the grower has had sufficient opportunity to obtain results from definite experiments. In the coastal districts where the rainfall is somewhat more certain, and the soils are of sufficient fertility to necessitate spacing the rows 4½ to 5 feet apart, it may be advisable to reduce the distance between the plants to 12 or 15 inches, as, in normal seasons, the conditions will be favourable to producing well-fruited plants bearing cotton of good strength and length.

Only One Plant.

It is not recommended that more than one plant be left to the space. Many of the growers of this past season who planted their cotton in hills, left the plants unthinned, or, in some cases, two to the hill. Under the droughty conditions, competition for plant food and moisture checked the development of both plants with a consequent detrimental effect on the quality of the lint and the yield.

Check-row System.

Some of the growers of this season have planted their cotton on the check-row system—that is, on the square. The advantages claimed for this system of planting are that the expense of cultivation will be less, owing to it being possible to cultivate both ways with a machine and thus reduce the amount of hand labour, and the picking will be facilitated as it will be easier for the pickers to get to the lower bolls.

Dangers Thereof.

Owing to the droughty conditions of this season, there has been no opportunity afforded of studying this system as regards the growth of wide-spaced plants under conditions suitable for the development of luxuriant growths. It is pointed out, though, that there may be danger under conditions of heavy rainfall of very rank plants being developed, which may be severely damaged by heavy winds owing to the tendency of widely-spaced plants to develop large basal limbs. These limbs would also hinder the pickers in their progress between the rows.

Disadvantages Thereof.

This season the plants have been of such small stature in the blocks where this system has been used, that the yield has been reduced owing to the wide spacing between the hills, distances of 4 feet being the average spacing.

There may be some districts where this system of spacing is advisable, but for the average grower it is advised that the system of wide distances between the rows and from 15 to 20 inches between the plants be used for the bulk of the crop. It is recommended that each grower experiment with the cross-check system in order to demonstrate to his own satisfaction the merits of the two systems.

Difficulty of Securing Stand.

Greater difficulty is to be experienced in securing a perfect stand under this system owing to the necessity of planting in hills in order to get the plants on the square. Hill planting is not advised, on account of increasing the possibilities of damaging the stand by insect injury owing to the proximity of the plants during the seedling stage. The loss of a hill under such wide spacing places a heavy burden on the adjacent plants, whereas in the continuous drill system this injury, if occurring before thinning, may be overcome by leaving the next plants spaced closer together.

CULTIVATION.

Cultivate Frequently.

Thorough and frequent cultivation of the cotton plant is highly desirable, and under semi-droughty or droughty conditions, it is almost an absolute necessity if staple cotton of good quality is to be produced. Because the crop is free of weeds should not deter the grower from cultivating his field, as there are other factors to be taken into consideration. By frequent cultivation of the soil the evaporation of the soil

moisture is greatly reduced, the mechanical condition is improved, and the aeration effected by the cultivation is conducive to the "sweetening" of the soils of a "sour" nature, thereby improving the conditions favourable for the development of the plant.

Average Number in U.S.A.

In the United States, surveys have been made by the Department of Agriculture which have shown that the number of cultivations for whole districts average six, after the crop is planted; and it is believed that this number should at least be equalled, and preferably increased, by the cotton-growers of Queensland.

Time of First Cultivation.

The first cultivation should be made as soon as the rows of young plants are discernible. This is advisable as the surface soil is generally packed somewhat by the harrowing and planting operations, and the growth of the weed and grass seedlings, which may have developed during the period of the germination of the cotton seed, will be checked.

Cultivate after Thinning.

Another cultivation should be made immediately following the "chopping" (thinning) operations in order to loosen the soil and to work the loose dirt towards the row in order to establish a mulch around the plants. The establishing of the mulch around the plants is beneficial in that the evaporation of the moisture from the soil in between the plants in the row is checked, and the loose dirt also assists in retarding the development of the grass seedlings. The dirt should be worked towards the plants at each cultivation, and at the "laying by" of the crop (the last cultivation before the plants are too large) it is advisable to "hill up" the plants to a good degree, not only to reduce the evaporation and check the weed growth, but also to brace the plants and assist them in withstanding the effects of heavy winds.

Hilling Cotton.

This "laying by" can be accomplished with disc cultivators, one-row scarifiers with "hillers" on the outside shanks, riding cultivators with the hillers on the inside set to throw the soil in, or, if done carefully, by a light "turning" plough set very shallowly. Care should be exercised with all of these machines to not cut deeply enough to sever the surface roots.

Hilling Controls Weeds.

It was observed this season that the growers were not hilling the plants at an early stage of the plant's growth, but it is believed that after the "chipping" is completed, it is advisable to work the dirt to the plants a little higher at each cultivation. This is of decided advantage in assisting in controlling the weed growth, and, done properly, should greatly reduce the expense of weeding.

PLATE II.—A VERY HEAVY PICKING. A SEVERE STORM WOULD CAUSE CONSIDERABLE DAMAGE TO THE CROP.

Do not delay the cultivation after the thinning until that operation for the whole field is completed. It is better to have the cultivators throwing the soil to the plants not later than a day behind the thinning, and thereby greatly reduce the evaporation of the moisture in the row where the hoe has chopped.

PICKING.

Ideal Conditions.

The climatic conditions during most of the period of the year in which picking takes place in Queensland are nearly ideal for picking cotton of the very best grade. Practically no rain, very little wind to fluff out and dry the cotton, plenty of sunshine, only moderate amounts of dew, and no frost until late in the season. All are conducive to clean picking, and the growers should utilise these natural advantages to the utmost.

WHEN TO PICK.

Allow a Good Opening.

It is highly essential that only thoroughly matured cotton be sent to the gins, in order to obtain the best grade of lint, and this can best be assured by allowing a considerable number of bolls per plant to open before commencing the picking operations. Where a good opening of bolls is visible the crop is in a condition where the pickers are less liable to pick partially opened bolls of immature cotton, the cotton will be more uniform in strength and character, and the ginner can deliver a good sample of lint.

Family Picking.

Where the grower and his family are doing the picking the crop can be kept picked closer than when pickers are employed, although it is pointed out that less acreage can be handled where the picking is kept up with very closely, due to the amount of walking necessary to obtain the same amount of seed cotton that would be picked in a field of a heavily opened crop.

Contract Picking.

This point should be kept in mind by the grower, that it is necessary that the picker be able to pick good weights for the day in order that the price of picking can be kept to a reasonable basis and the picker at the same time obtain a living wage.

Amount per Day.

In a well-grown cotton with the proper amount of open bolls it is entirely feasible for the average picker of a short period of training to pick 100 lb. of seed cotton per day, and it is believed that as the industry becomes better established and the pickers more experienced that 150 lb. a day will be more nearly the average. Several pickers of little experience were reported to have picked from 150 to 160 lb. a day during this season, under conditions not conducive to picking large weights owing to the light bodied cotton of the droughty season.

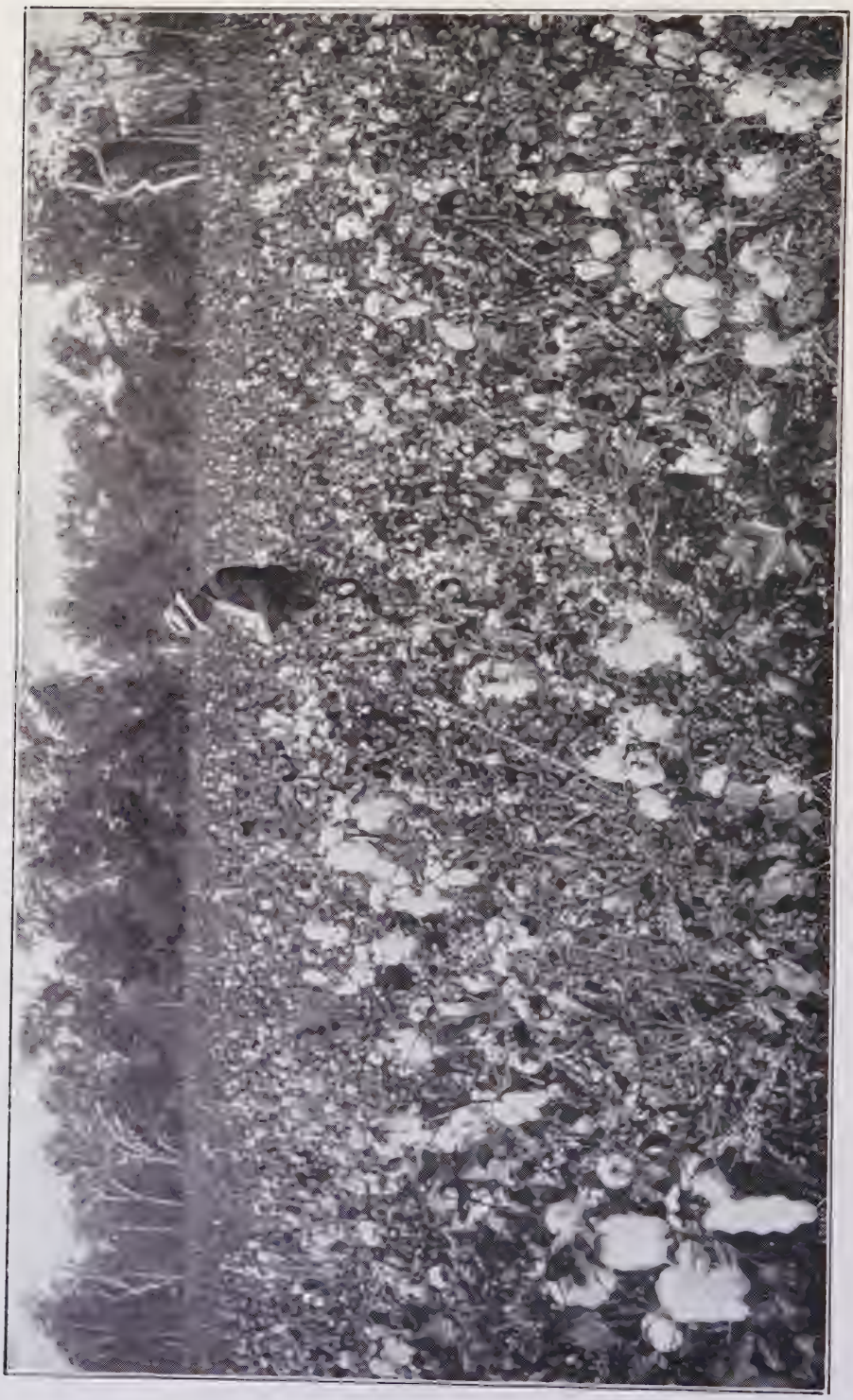


PLATE III.—A CROP OF COTTON BEYOND THE PROPER STAGE OF PICKING. NOTE THE STRAGGLY LOCKS HANGING OUT OF THE BOLLS.

Price of Picking.

The bulk of this season's crop of cotton has been satisfactorily picked at 1½d. per lb., and if the grower allows a proper amount of cotton to open before commencing picking, the pickers can make good wages, especially as they become more experienced and proficient.

PICKING RECEPTACLES.

Pick in Sacks.

The cotton pickers of the United States mostly use heavy duck sacks tied around the waist or suspended at the waist by a long strap hung over the shoulder. This sack is 24 to 30 inches wide and 7 to 8 feet long. This length of sack allows the weight of the cotton to rest on the ground without pulling on the picker's hips and also allows freedom of movement in bending over the plants. When the picking of one plant is completed the picker grabs the bag at the back of him with one hand and drags it along the ground to the next bush.

Drawbacks of Present Methods.

When the pickers in Queensland understand the construction and operation of these sacks, it is believed that the rate of picking per day will be increased over the present method of using chaff sacks and kerosene tins. Great loss of time is occasioned by the use of kerosene tins, with the necessary frequent emptying of them, and much inconvenience is encountered in the using of chaff or maize sacks tied around the waist.

NECESSITY FOR CLEAN PICKING.

Clean Cotton Required.

The demand of the cotton spinning industry of to-day is good, clean cotton, and the growers of Queensland should endeavour to forward only this grade of cotton to the ginneries. Freedom from leaf, grass, grass and weed seeds, immaturity, dirt, excessive stains, water or excessive moisture, disease and all foreign matters, is necessary in order to produce a high grade of lint.

Wet Cotton Objectionable.

Wet cotton should be particularly guarded against, as it is exceedingly difficult, even if the cotton is free of leaf or foreign matter, to gin a good sample of wet cotton on account of the fibres matting together when being ginned. This is very objectionable from the spinners' view point as such cotton contains a high percentage of waste.

Dry, Wet, or Damp Cotton.

There is no objection to picking cotton before the morning dew drys, but such cotton should be spread out in the sunlight on a clean wagon sheet or on the veranda, and stirred several times during the day to ensure proper drying.

Do not Delay Picking.

Grass and weed seeds are very difficult to remove from lint cotton, and the grower should endeavour to keep the fields free from such

PLATE IV.—DRYING DAMP COTTON PREPARATORY TO PACKING FOR FORWARDING TO THE GIN.

PLATE V.—DRYING COTTON AND WOOL-PACKS OF COTTON READY FOR THE GINNERY.

during the picking season. Cotton left in the boll until the winds blow it out straggly is often subject to this trouble, and the grower is cautioned not to allow his crop to remain unpicked for too long a period of time. Not only is this inadvisable on account of collecting foreign matter, but there is a danger of non-seasonable storms occuring, which cause a loss to the crop through part of it being beaten to the ground, or being stained; also cotton which is left for too long a period of time in the sunlight loses some of its bloom and character, with a consequent resulting loss in value.

Pick Good Cotton Only.

Particular care should be exercised to not pick the small, hard, unopened locks of cotton. The fibres in these locks are weak and of light body, and when mixed with good lint lower the value of the sample, as the weak, light bodied fibres are combed out in the mills as waste.

HOW TO FORWARD THE COTTON TO THE GINS.

Methods of Shipping.

The seed cotton can be shipped in second-hand wool packs and chaff or maize sacks. The grower's name and district should be written or stencilled on the sack. This is of assistance to the ginnery in checking the receipt of the sacks as they arrive, and also aids in the segregation of the various types of cotton preparatory to ginning.

Pack Only One Grade in a Sack.

Only cotton of one grade should be packed in a sack. The sacks are graded upon arrival and stored under different grades until ginned, and unless the growers co-operate by shipping only the one grade of cotton in a sack, much of the value of these operations will be lost.

Uniformity Required in the Lint.

For the purpose of the disposal of cotton lint after ginning it is important that each bale of lint should be of one grade only in order to obtain the maximum value of the different grades; and unless each sack of seed cotton, forwarded to the ginnery by the grower, is of the one grade it is impossible to place a uniform grade of lint in the finished bale.

Wool Packs Returned.

During this season the ginneries, upon receipt of shipments of cotton in wool packs, have returned an equal number of wool packs for a nominal sum to cover the cost of handling, freightage, &c. The chaff and maize sacks have not been exchanged.

NECESSITY FOR GRADING COTTON.

Not only is it necessary that only pure varieties of cotton be grown in Queensland but also that these cottons should be graded and ginned in such a manner as to entitle them to the highest prices.

PLATE VI.—A GROWER'S APPARATUS FOR PACKING SEED COTTON IN A WOOL-PACK.

PLATE VII.—LOADS OF SEED COTTON ARRIVING AT THE RAILROAD FOR FORWARDING TO THE GINNERY.

All Cotton to be Classed and Graded.

In order to ensure that Queensland cotton will be prepared in this manner, the Department of Agriculture is securing an experienced cotton classer from England to supervise the classing, grading, and marketing of all cotton acquired by the Government.

TERMS OF THE GOVERNMENT GUARANTEE.

During 1923, the Department of Agriculture and Stock, through its agent, the British Australian Cotton Association, Limited, will supply cotton seed for planting purposes at a price of ½d. per lb., railage free.

Further, the Department will advance 5½d. per lb. for seed cotton of a length of staple of 1¼ inches, of good quality and free of all foreign matter and disease; and 5d. per lb. for seed cotton of a length of staple less than 1¼ inches, of good quality and free of all foreign matter and disease.

These prices will be paid for seed cotton delivered at the grower's nearest railway station prior to 31st July, 1924, the Government paying the railage to the nearest ginnery of the British Australian Cotton Association, Limited.

The raw cotton will be subsequently ginned and sold on owner's account, and, after paying the expenses, the surplus, if any, over and above the original 5d. or 5½d. per lb., as the case may be, will be paid to the supplier of the raw cotton.

Application for seed at the rate of 15 lb. per acre, accompanied by a cheque for the amount thereof at the rate of ½d. per lb., should be made direct to the Under Secretary, Department of Agriculture and Stock, Brisbane, or to the British Australian Cotton Association, Limited, Elizabeth street, Brisbane, or Rockhampton.

A price per pound of seed cotton will be advanced from the 1st August, 1924, to the 21st July, 1926, but this price and attendant conditions will be determined at a later date.

Advances after the 31st July, 1923, will only be made in connection with areas of cotton under 50 acres for any one man or company.

In all cases, the seed cotton must be delivered at the nearest railway station or port prior to the 31st July in each year.

The advances in all cases will only apply to cotton produced from seed supplied through the Department of Agriculture and Stock, and no cotton seed can be planted in Queensland excepting such seed as has been obtained through the Department of Agriculture and Stock or its especially appointed agents.

INDEX TO PLATES VIII. TO XII.

PLATE VIII.—Partially opened bolls showing immature seed cotton. Seed cotton of bolls in this condition should not be picked, as the fibres are not fully developed, being lacking in strength and body, and is still damp around the seeds, making it unsuitable for ginning. Such bolls are difficult to pick, and handicap the picker in securing a proper day's weight.

PLATE IX.—Well-developed bolls containing fully-matured cotton in the ideal stage for picking.

PLATE X.—Bolls in a condition past the proper stage for picking. (Note the leaf scattered over the strung-out locks of cotton.) A hard storm would cause severe loss in a crop at this stage.

PLATES XI. AND XII.—Bolls which have been injured by insect pests and then infected with one of the internal boll rots. Seed cotton of bolls in this condition should not be picked as the fibres are weak, immature, of a dark-brown or black colour, and would lower the value of the rest of the sample with which it was ginned.

PLATE VIII.

PLATE IX.

Plate X.

PLATE XI.

Plate XII.

THE QUEENSLAND COTTON INDUSTRY.

THE GOVERNMENT AND COTTON-GROWING ASSOCIATION—TERMS OF AGREEMENT—GINNING AND MARKETING.

The Minister for Agriculture (Hon. W. N. Gillies) has laid upon the table of the Legislative Assembly the papers appertaining to, and copies of, all agreements entered into by the Government with the British-Australian Cotton Growing Association in respect to the ginning and marketing of seed cotton grown in Queensland.

TERMS OF AGREEMENT.

A copy of an agreement dated 30th September, 1922, sets out that the company should, before 31st July, 1924, erect, equip, and complete in Queensland so many cotton-ginning factories as might from time to time during the period of the agreement be sufficient for treating all the seed cotton grown in Queensland during such period, and at least one cotton-seed oil mill for the treatment of surplus cotton seed. Every factory erected by the company should, unless otherwise approved by the Minister, continue proper railway facilities connected with the Queensland Government railways.

The company undertook to expend at least £150,000 in the erection, equipment, and completion, before 31st July, 1924, of ginning factories and oil mills in Queensland.

The Government should pay the company 1¼d. per lb. for lint ginned, pressed, baled, and delivered on trucks for shipping. All cotton seed, other than the seed required by the Government for cotton-growers for planting and for planting Government experimental plots, and all linters and by-products, should be the property of the company, but the company should pay to the Government such price as may be mutually agreed upon.

The company, at the request of the Minister, should consign, free of cost on railway trucks at the factory to cotton-growers for planting and for planting on Government experimental plots, such cotton seed of best quality as might be necessary. Such cotton seed should be delivered, properly bagged or baled, at such times and in such quantities as the Minister should require; and the company should charge ½d. per lb. for seed so delivered to cotton-growers as its agents, and should demand and receive the payment therefor on behalf of the Government.

The company should have the right to refuse to accept delivery of or issue a certificate for any cotton which is diseased, stained, or immature, or is not of good quality; but shall notify the Minister and the consignor that such cotton is diseased or not of good quality, and the Minister should determine whether it should be accepted, and, if so, at what rate and upon what terms.

The Government appoints the company the sole agent of the Government for the shipping and sale of the lint produced from seed cotton. The company, if required by the Government, should sell any portion of lint in Australia that the Government desired.

The company is to act as agent for the Government in connection with the carrying out of the existing agreement between the Government and the British Cotton Growing Association. All lint not of quality for acceptance by the said association shall be sold by the company at the best price procurable.

The company may allow not more than two months' credit to any customer, but may not, without the consent of the Minister, allow any longer credit.

The company shall be entitled to a commission at the rate of 1½ per cent. on all lint delivered by the company to the British Cotton Growing Association or any person or corporation, and a commission at the rate of 2½ per cent. on all lint sold by the company, including lint sold by the company after rejection by the British Cotton Growing Association, but no commission is to be paid if the company, either directly or indirectly, becomes the purchaser of or is in any way interested in the purchase of any lint, the subject-matter of the agreement.

The company at all times must permit the Auditor-General of Queensland, or authorised person, to examine and audit all books and accounts of the company relating to the agreement. The agreement is to take effect from 1st August, 1923.

An addendum states that the agreement is extended for a period of two years from 31st July, 1924, upon the same terms and conditions as contained in the agreement.

General Notes.

The Pan-Pacific Congress.

Members of the staff of the Department of Agriculture and Stock attending the Pan-Pacific Science Congress in Melbourne are Messrs. Henry Tryon (Government Entomologist and Vegetable Pathologist), H. T. Easterby (Director of Sugar Experiment Stations), and Edmund Jarvis (Entomologist, Bureau of Sugar Experiment Stations).

Curassows Added to Zoological Collection.

A pair of curassows have recently been received from Mr. E. Joseph, Sydney, as an addition to the Brisbane Botanic Gardens zoological collection. The cu-rass-ow, native of Brazil, is a large black bird, about the size of a hen turkey, possessing a red bill with sharp cutting edges not unlike a parrot's. The general appearance of these birds is somewhat like the well-known water fowl "Red Bill," but they are much larger, having a small crest on the head, and tail feathers not unlike a turkey's.

Model Australian Irrigation Farm for Wembley.

"At the meeting of the Australian Commission of the British Empire Exhibition, which was recently held in Adelaide, it was decided to arrange for a display of a model irrigation farm at Wembley Park, London." Hon. A. J. Jones (Minister for Mines), the chairman of the Queensland Commission, made this announcement last week, adding: "The model farm will represent a typical irrigated holding on the Murray River basin, having 15 acres in fruit and 50 acres in fodder for dairying. The model will be 80 ft. by 32 ft., or on a scale of approximately 1 in. to the yard. The model, including implements, will be prepared in Australia. Arrangements are being made to prepare the land for the model irrigation farm, which will be located in the grounds of the Australian section of the Empire Exhibition. Fodder plants and grasses will be raised on the site, which will be fenced and provided with a good water supply. The model of the farm will be prepared by the State Rivers and Water Supply Commission in Victoria."

"Bunchy Top" in Bananas -Commonwealth Co-operation with States in Research Work.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) said recently in the course of a Press announcement that it would be remembered that an arrangement had recently been made with the New South Wales Government, under which the two States concerned are to share the expenses for the investigation into "Bunchy Top," and that Dr. Darnell Smith and Mr. Henry Tryon are to conduct the research according to the methods which appeal to them, and are to submit a report not later than 31st December next. Since then the Commonwealth Government has offered to take part in the investigations and to furnish £1,500 towards the cost, provided the Governments of New South Wales and Queensland contribute an equal amount. The two States have agreed to the proposal, and Sir George Knibbs, Chairman of the Commonwealth Bureau of Science and Industry, as representing the Federal Government, has been informed of the acquiescence of the Queensland Government in the proposal.

When to Cut Lucerne—Results of Experiments.

In experiments carried out over a number of years at Utah Agricultural Experiment Stations to determine the best time for cutting lucerne, it was found that as regards the amount of increase in live weight produced on a given area the relative value of the cuts was as follows:—Early cut (immediately after flowering), 100; average cut (one week after flowering begins), 71. Cattle fed with lucerne hay, with or without grain supplement, ate a little more hay per day and made more rapid gains in live weight when given early-cut lucerne hay than with late-cut lucerne hay. Given equal weights of hay, the earlier cut produced the best results. In the case of the second and third cut the proportion was as 100, 85, 75. The amount of hay consumed per head and per day was about the same, whether the hay was cut early or late, although rather larger quantities of the former were eaten than of the latter. The amount of dry matter and digestible matter required to produce a certain increase in live weight was, however, decidedly less in the case of the early crop, and more in that of the late crop. The proportion for the three cuts was as 100, 131, 166.

Ginnery "Souvenirs"—A Unique Collection.

One of the most interesting exhibits at the Brisbane Show was a collection of articles picked out of seed cotton sent to the ginneries, articles that are exceedingly dangerous in the process of ginning as probable causes of fire and certain causes of damage to the intricate and delicate machinery of the gins. In the collection were a stirrup iron, a cigar butt, wax matches, a child's doll, a baby's bib, a sixpenny piece, a child's shoe, a massive eye-bolt, live rifle cartridges, and even a cob of corn. Though there was something humorous in the collection, such carelessness of consignors might easily cause a tragedy in the mill. Cotton is most inflammable, and actually one article shown did result in a fire.

A Tea-growing Proposal.

Some weeks ago, Mr. C. H. Witherington, a teagrower from Assam, came to Brisbane with the object of seeking to encourage the cultivation of tea. He discussed the matter with the Premier (Hon. E. G. Theodore) and the Minister for Agriculture (Hon. W. N. Gillies), the latter informing him that he would consider the advisableness of establishing an experimental area to ascertain whether tea could be grown on a commercial basis. Mr. Witherington, who is now in New South Wales, has been advised by the Minister for Agriculture that the Government is not willing to do anything in the matter just now, principally because in present circumstances the Government requires for other purposes the money that would be necessary for such a project.

Seed Cotton Deliveries.

The British Australasian Cotton Association, Limited, advises that the receipt of seed cotton at the various ginneries to 14th August, was as follows:—

	lb.	£	s.	d.
Rockhampton	3,630,725 ..	79,271	4	8
Wowan	1,757,941 ..	40,275	7	8
Whinstanes	4,503,171 ..	102,382	5	10
Gayndah	711,816 ..	16,311	9	8
Dalby	402,161 ..	9,215	12	1
Totals	11,005,814 ..	247,455	19	11

The Tiller at the Tiller—Broken Nature Restored.

Thus a writer in the "Freeman":—"To the scene of devastation at Ypres came the technicians, the scientists, the agricultural experts, the foresters, the bankers, the statesmen . . . Weeks passed in council and conference and consultation. Then the collective judgment of this carefully selected group was solemnly pronounced; devastated Flanders was beyond hope of redemption. Never again could it become the land of the plough and the harrow, the crop and the flock. Then came man and his shovel. With no word of complaint, with no scientific suggestion or device, with no shuffling of the dirty old cards, with no mournful pleading for aid, with no saintly prostestations to heaven, the men and the women and the children took their shovels in their hands, and went down into this waste, hour by hour, day by day, week by week. . . . To-day the fields of Flanders are green."

The 1922 Wheat Crop.

The following return, compiled by the Registrar-General, shows the result of the wheat crop for Queensland for 1922:—

Division.	Estimate.		Actual.	
	Acres.	Bushels.	Acres.	Bushels.
Moreton	516	9,096	450	7,482
Wide Bay	794	4,733	961	12,404
Maranoa	1,707	14,400	2,167	9,061
Downs	146,786	1,873,017	141,914	1,848,889
Total State, 1922	149,803	1,901,246	145,492	1,877,836
Total State, 1921	..	..	164,670	3,025,786
Decrease, 1922	..	..	19,178	1,147,950
Decrease, Actual, on Estimate 1922	..	..	4,311	23,410

Staff Changes and Appointments.

Mr. E. H. G. George has been appointed Cane Tester at Invicta Sugar Mill, which commences crushing operations on the 29th August.

Mr. E. J. Shelton, of Strathfield, New South Wales, has been appointed Instructor in Pig Raising, as from the 17th August, 1923.

Mr. W. R. Burnett, formerly acting Inspector of Stock at Durah, has been appointed Inspector of Stock, as from the 17th August, 1923.

Messrs. J. S. Penrose (B.V.Sc., M.R.C.V.S.) and M. J. Reidy (M.R.C.V.S.) have been appointed Part-time Veterinary Officers The former is to be stationed in the Central district, and the latter in the Northern district.

Mr. W. C. Woodhouse, District Inspector of Stock, Normanton, has been transferred to Bowen; and Inspector Logan, of Cloncurry, has been transferred to Normanton.

The Officer in Charge of Police at Babinda has been appointed an Acting Inspector under the Diseases in Stock Act.

Police Constable Bernard McDonnell has been appointed an Inspector under the Slaughtering Act.

Maurice Robinson Tennent, of the Dairy Branch of the New Zealand Department of Agriculture, has been appointed Dairy Instructor in the Queensland Department.

W. B. Horneman, Assistant Dairy Instructor at the Queensland Agricultural High School and College, has been appointed an Inspector under "*The Dairy Produce Act of* 1920."

The resignation of P. H. M. Goldfinch, as Millowners' Representative on the Central Sugar Cane Prices Board, has been accepted as from the 31st August, 1923.

The appointments of the following officers of the Department have been confirmed:—

William Rowlands, as Fruit Packing Instructor, as from the 17th January, 1923;

Harold L. Pentecost, as Herd Tester, as from 1st January;

William Maggs, as Inspector under the Diseases in Plants Act, as from the 25th January, 1923;

Douglas F. Keith, as Herd Tester, as from the 1st January, 1923;

Frank T. Heers, as Dairy Inspector, as from 1st January;

Eileen Mary Boody, as Typist, as from the 15th January; and

Edward F. Duffy, as Inspector under the Diseases in Plants Act, as from the 22nd February, 1923.

Answers to Correspondents.

Agricultural Tile Draining.

E.T.B. (Eumundi)—

"Land Drainage," by Powers and Teeter, is a standard work. The present Brisbane prices for pipes for field drainage are: 2-inch, 23s. per 100; 3-inch, 34s. 6d. per 100; 4-inch, 52s. per 100; 6-inch, 77s. 6d. per 100.

Leg Weakness in Chickens.

H.J.T. (Roma).—Mr. J. Beard, Poultry Instructor, advises:—

Leg weakness in chickens is sometimes caused by over-feeding with fat-producing foods, or by an insufficiency of bone and muscle-forming material. It may also be due to constitutional weakness; when such is the case, the complaint will be manifested in young chickens. If affected chickens are restored to health they should never be used for breeding purposes as they will transmit the weakness to the offspring. Do not allow the chickens to camp in a wooden box or on a boarded floor, if this is unavoidable place a corn sack under them. This provides a grip for the feet and prevents their legs from spreadeagling. If you are using the water from the house tank for their drinking water add Douglas Mixture or a few drops of tincture of iron. This Department's pamphlet on "Poultry" is now out of print, but a copy of the new edition will be forwarded to you when available. Two copies of "Poultry," a journal published in Sydney and containing a lot of seasonal information, has been forwarded by post.

Asphalt.

J.H. (Gooroolba).—The City Engineer, Mr. E. F. Gilchrist, advises:—

The term asphalt has a wide range and is used to denote bitumen. Asphalt, which is composed of bitumen as a binder used to hold or cement the aggregate (particles of sand, stone, chips, &c.) together, and even when tar is used as a binder the resultant mixture is termed asphalt.

If the word tarpaving is substituted it makes the necessary distinction. I presume tarpaving is what is meant. If your correspondent is in a district where a stone crusher is at work and can get the run of crusher aggregate —*i.e.*, the material as it comes from the crusher, and separates sufficient material for his work that will pass through a three-eighth square mesh sieve, the desired grading will be obtained.

If, on the other hand, he has to make up the aggregate, it will be necessary to procure 100 per cent. material passing a three-eighth square mesh, 30 per cent. of which shall be retained on one-eighth mesh, 15 per cent. on 20 mesh, and the balance of 45 per cent. will grade down to the finest sand or stone dust procurable to which 10 per cent. of tar shall be added. If the aggregate can be brought to within 10 or 15 per cent. of these figures a good mixture should result.

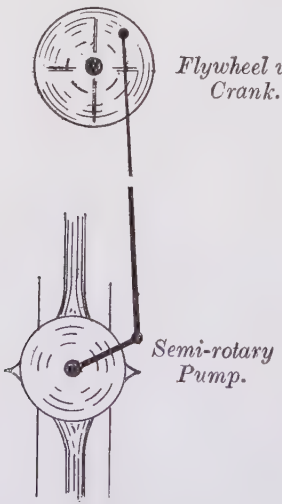
The tar should be poured into a flattened heap and raked over with a stiff rake till properly mixed. The tar should be boiled to the proper consistency; or better, distilled or prepared tar purchased.

The mixture will require from 18 to 23 gallons of tar per cubic yard of aggregate, depending upon the amount of fines contained therein. The finished surface should be dusted with dust or fine sand.

Horse-Gear Attachment for Semi-Rotary Pump.

W.W. (Kilkivan)—Mr. A. E. Gibson, Instructor in Agriculture, replies:—

This correspondent does not supply sufficient information as to the "direction of drive" from horseworks to semi-rotary—whether it is horizontal or vertical. It is suggested that the attachment of a geared pumping head would be a better system than that by direct coupling from horseworks to semi-rotary pump handle, also vertical drive is to be preferred to a horizontal drive.



Shoulder Sores in Working Horses.

A.H. (Kingaroy)—Mr. A. McGown, M.R.C.V.S., Veterinary staff, advises:—

As these sores are caused by badly-fitting collars, it is necessary before treatment to see that the collar fits properly. In most cases it will be found necessary to chamber the collar—*i.e.*, a hole must be cut in the leather which comes in contact with the sore and the padding pushed in equally all around so as to make a hole which will prevent rubbing. After this has been done the sore should be dressed twice daily with this solution:—Powdered alum, ½ oz.; water, 1 pint.

Orchard Notes for October.

THE COAST DISTRICTS.

October is frequently a dry month over the greater part of Queensland, consequently the advice that has been given in the notes for August and September regarding the necessity of thorough cultivation to retain moisture is again emphasised, as, unless there is an adequate supply of moisture in the soil to meet the trees' requirements, the coming season's crop will be jeopardised, as the young fruit will fail to set.

Thorough cultivation of all orchards, vineyards, and plantations is therefore imperative if the weather is dry, as the soil must be kept in a state of perfect tilth, and no weeds of any kind must be allowed to grow, as they only act as pumps to draw out the moisture from the soil that is required by the trees or fruit-yielding plants. Should the trees show the slightest sign of the want of moisture, they should be given a thorough irrigation if there is any available means of doing so, as it is unwise to allow any fruit trees to suffer for want of water if there is a possibility of their being supplied with same. Intermittent growth, resulting from the tree or plant being well supplied with moisture at one time and starved at another, results in serious damage, as the vitality is lessened and the tree or plant is not so well able to ward off disease. A strong, healthy, vigorous tree is frequently able to resist disease, whereas when it has become debilitated through neglect, lack of moisture or plant food, it becomes an easy prey to many pests. If an irrigation is given, see that it is a good one and that the ground is soaked; a mere surface watering is often more or less injurious, as it is apt to encourage a false growth which will not last, and also to bring the feeding roots to the surface, where they are not required, as they only die out with a dry spell and are in the way of cultivation. Irrigation should always be followed by cultivation, so as to prevent surface evaporation and thus retain the moisture in the soil.

All newly planted trees should be carefully attended to, and if they show the slightest sign of scale insects or other pests they should receive attention at once. All growth not necessary to form the future tree should be removed, such as any growths on the main stem or main branches that are not required, as if this is done now it will not only save work later on, but will tend to throw the whole strength of the tree into the production of those limbs that will form the permanent framework of the tree. In older trees all water sprouts or other similar unnecessary growths should be removed.

Keep a good lookout for scales hatching out, and treat them before they have become firmly established and are coated with their protective covering as they are very easily killed in their early stages, and consequently much weaker sprays can be used. The best remedies to use for young scales hatching out are those that kill the insects by coming in contact with them, such as miscible oils, which can be applied at a strength of 1 part of oil in 40 parts of spraying material and will do more good than a winter spray of double the strength. In the use of miscible oils or kerosene emulsion, always follow the directions given for the use of these spraying materials, and never apply them to evergreen trees when they are showing signs of distress resulting from a lack of moisture in the soil, as they are then likely to injure the tree, whereas if the tree is in vigorous growth they will do no harm whatever.

All leaf-eating insects should be kept in check by the use of an arsenate of lead spray, taking care to apply it as soon as the damage appears, and not to wait till the crop is ruined. Crops, such as all kinds of cucurbitious plants, tomatoes, and potatoes are often seriously injured by these insects, and the loss occasioned thereby can be prevented by spraying in time. In the case of tomatoes and potatoes, a combined spray of Bordeaux or Burgundy mixture and arsenate of lead should be used, as it will serve the dual purpose of destroying leaf-eating insects and of protecting the plants from the attack of Irish blight.

Grape vines require careful attention, and, if not already sprayed with Bordeaux mixture, no time should be lost in applying this material, as the only reliable method of checking such diseases as anthracnose or black spot and downy mildew is to protect the wood and foliage from the attack of these diseases by providing a spray covering that will destroy any spores that may come in contact with them. The planting of bananas and pineapples can be continued during this month. See that the land is properly prepared and that good healthy suckers only are used. Keep the plantations well worked, and allow no weed growth. Keep a very careful lookout for fruit flies; destroy every mature insect you can, and gather and destroy every fallen fruit. If this is done systematically by all growers early in the season, the subsequent crops of flies will be very materially decreased. See that all fruit sent to market during the month is carefully handled, properly graded, and well packed—not topped, but that the sample right through the case or lot is the same as that of the exposed surface.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Much of the matter contained under the heading of "The Coast Districts" applies equally to these parts of the State, as on the spring treatment that the orchard and vineyard receives the succeeding crop of fruit is very largely dependent. All orchards and vineyards must be kept in a state of perfect tilth, and no weed growth of any kind should be allowed. In the Western districts, irrigation should be given whenever necessary, but growers should not depend on irrigation alone, but should combine it with the thorough cultivation of the land so as to form and keep a fine soil mulch that will prevent surface evaporation.

All newly planted trees should be carefully looked after and only permitted to grow the branches required to form the future tree. All others should be removed as soon as they make their appearance. If there is any sign of woolly aphis, peach aphis, or scale insects, or of any fungus diseases on the young trees, these diseases should be dealt with at once by the use of such remedies as black leaf forty, Bordeaux mixture, or a weak oil emulsion. In older trees, similar pests should be systematically fought, as if kept in check at the beginning of the season the crop of fruit will not suffer to any appreciable extent. Where brown rot has been present in previous years, two or more sprayings with Bordeaux mixture can be tried, as they will tend to check other fungus growths, but at the same time the sodium or potassium sulphide sprays are more effectual for this particular disease and should be used in preference when the fruit is nearly full grown. All pear, apple, and quince trees should be sprayed with arsenate of lead—first when the blossom is falling, and at intervals of about three weeks. Spraying for codlin moth is compulsory in the fruit district of Stanthorpe, and wherever pomaceous fruits are grown it must be attended to if this insect is to be kept in check.

In the warmer parts a careful watch should be kept for any appearance of the fruit fly, and, should it be found, every effort should be made to trap the mature insect and to gather and destroy any affected fruit. If this is done, there is a good chance of saving the earlier ripening summer fruits, if not the bulk of the crop. Tomato and potato crops will require spraying with Bordeaux mixture, as also will grape vines. Keep a very strict watch on all grape vines, and, if they have not already been treated, don't delay a day in spraying if any sign of an oil spot, the first indication of downy mildew, appears on the top surface of the leaf. Spraying with Bordeaux mixture at once, and following the first spraying up with subsequent sprayings, if necessary, will save the crop, but if this is not done and the season is favourable for the development of the particular fungus causing this disease, growers can rest assured that their grape crop won't take long to harvest.

Where new vineyards have been planted, spraying is also very necessary, as if this is not done the young leaves and growth are apt to be so badly affected that the plant dies.

THE HOME PROJECTS SCHEME.

With the particular objects of noting the progress made in the home projects scheme connected with the Nambour Rural School, Mr. J. D. Story, I.S.O. (Public Service Commissioner and Chairman of the Administrative Committee of the Council of Agriculture), accompanied by Mr. B. J. McKenna (Under Secretary for Education) and Mr. L. Morris (Superintendent of Technical Education) visited Nambour in the course of the month. Practical results from two of the home projects —the packing classes and the pig club—were very much in evidence, and would seem to remove any doubts about the ultimate success of the home projects scheme. A packing competition for school children was held at the local district show, and the pupils acquitted themselves very creditably, showing great dexterity in the packing, and giving evidence that they had been carefully trained. Such practical training cannot have anything but an excellent effect on the children. In addition, eleven pigs had been entered, and their condition clearly demonstrated that the children had exercised much care in the rearing and feeding their live stock, their work receiving warm praise from practical producers, who were present at the show. The Home Projects and Agricultural Clubs have been established on the assumption that many boys and girls wish to make money by farming, that the agricultural institutions have information that will help farmers to increase their profits, and that the chances of success are increased greatly when several persons in the same neighbourhood undertake the same work. The home farm provides special advantages, for it supplies opportunities to a boy to gain experience in the application of farming principles which he learns at the rural school. The home project is intended to throw the boy on his own resources, and thus to develop his powers of initiative, as well as to give him increased knowledge and skill in farming methods. In addition, the scheme has the further advantage of bringing parents and teachers into closer relationship. Finally, the financial end is not lost sight of, for profit is the definite aim of all such projects, as it is the aim of the farming business as a whole.

Farm and Garden Notes for October.

FIELD.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, sorghum, setaria, imphee, panicum, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, tumeric, chicory, and ginger. Coffee plants may be planted out. There are voluminous articles in previous journals giving full instructions how to manage coffee plants, from preparing the ground to harvesting the crop, to which our readers are referred.

KITCHEN GARDEN.—Our notes for this month will not vary much from those for September. Sowings may be made of most vegetables. We would not, however, advise the sowing of cauliflowers, as the hot season fast approaching will have a bad effect on their flowering. French beans, including butter beans, may be sown in all parts of the State. Lima and Madagascar beans should also be sown. Sow the dwarf Lima beans in rows 3 ft. apart with 18 in. between the plants. The kitchen garden should be deeply dug, and the soil reduced to a fine tilth. Give the plants plenty of room, both in sowing and transplanting, otherwise the plants will be drawn and worthless. Thin out melon and cucumber plants. Spraying for fungoid diseases should be attended to, particularly all members of the *Cucurbitaceæ* and *Solanum* families, of which melons and tomatoes are representative examples. Give plenty of water and mulch tomatoes planted out last month. Asparagus beds will require plentiful watering and a good top-dressing of short manure. See our instructions in "Market Gardening," obtainable on application to the Under Secretary, Department of Agriculture and Stock. Rosella seeds may be sown this month. No farm should be without rosellas. They are easily grown, they bear heavily, they make an excellent preserve, and are infinitely preferable to the mulberry for puddings. The bark supplies a splendid tough fibre for tying up plants. The fruit also makes a delicious wine.

FLOWER GARDEN.—The flower garden will now be showing the result of the care betowed upon it during the past two months. The principal work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant tuberose, crinum, ismene, amaryllis, pancratium, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep free from aphis, and cut off all spent flowers. Get the lawn-mower out and keep the grass down. Hoe the borders well, and trim the grass edges.

RINGING A BULL.

No great skill is required in ringing a bull. The necessary instrument is a bull punch, which cuts a clean passage through the septum dividing the two nasal cavities. The correct position for piercing is immediately below the cartilage. If the passage is made through the cartilage sensation is not very keen, and the animal is not under the same restraint as when the passage is made through the soft tissues.

FODDER FOR STARVING STOCK.

The protracted dry spell in some of the Southern districts has created a fairly heavy demand for relief fodder under the system established by the Government, and the State Produce Agency has been busily engaged in procuring fodder and despatching consignments to the affected areas. A question as to alleged delays in delivery was recently raised in Parliament, and in reply to which the Minister for Agriculture and Stock (Hon. W. N. Gillies) stated that he was unaware of the occurrence of any delay, and, contrarily, his department held a large number of complimentary letters from farmers in the drought-stricken areas respecting the expeditious despatch and delivery of fodder for relief purposes.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1923.	JULY.		AUGUST.		SEPTEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6·46	5 6	6·36	5·20	6 9	5 36
2	6·46	5·6	6·35	5·21	6·8	5·36
3	6·46	5·6	6·34	5·22	6·7	5·37
4	6·46	5·6	6·33	5·23	6·6	5·37
5	6·46	5·6	6·32	5·24	6·4	5·38
6	6·46	5·7	6·31	5·24	6·3	5·38
7	6·46	5·7	6·31	5·24	6·2	5·39
8	6·46	5·7	6·31	5·24	6·0	5·39
9	6·46	5·8	6·30	5·24	5·59	5·40
10	6·45	5·8	6·29	5·25	5·58	5·40
11	6·45	5·9	6·29	5·25	5·57	5·41
12	6·45	5·10	6·28	5·26	5·56	5·42
13	6·44	5·11	6·27	5·27	5·54	5·43
14	6·44	5·12	6·26	5·28	5·53	5·44
15	6·43	5·12	6·25	5·29	5·52	5·44
16	6·43	5·12	6·25	5·29	5·51	5·44
17	6·43	5·12	6·24	5·29	5·50	5·44
18	6·43	5·13	6·23	5·30	5·49	5·45
19	6·43	5·13	6·22	5·30	5·48	5·45
20	6·43	5·13	6·21	5·30	5·47	5·45
21	6·42	5·14	6·20	5·31	5·46	5·45
22	6·42	5·14	6·19	5·31	5·45	5·46
23	6·42	5·14	6·18	5·31	5·44	5·46
24	6·42	5·15	6·17	5·32	5·43	5·46
25	6·41	5·15	6·16	5·32	5·42	5·46
26	6·41	5·16	6·15	5·33	5·41	5·47
27	6·40	5·17	6·14	5·33	5·39	5·47
28	6·40	5·17	6·13	5·34	5·38	5·48
29	6·39	5·18	6·12	5·35	5·36	5·48
30	6·38	5·18	6·11	5·35	5·35	5·49
31	6·37	5·19	6 10	5·36	...	...

PHASES OF THE MOON, OCCULTATIONS, &c.

6 July ☽ Last Quarter 11 56 a.m.
14 ,, ● New Moon 10 45 a.m.
21 ,, ☾ First Quarter 11 32 a.m.
28 ,, ○ Full Moon 8 33 a.m.

7th July, Apogee, 9·48 p.m.
22nd ,, Perigee 11·54 a.m.

---

5 Aug ☽ Last Quarter 5 22 a.m.
12 ,, ● New Moon 9 17 p.m.
19 ,, ☾ First Quarter 4 7 p.m.
26 ,, ○ Full Moon 8 29 p.m.

4th Aug. Apogee, 4·24 p.m.
16th ,, Perigee, 8·0 p.m.

---

3 Sept. ☽ Last Quarter 10 47 p.m.
11 ,, ● New Moon 6 53 a.m.
17 ,, ☾ First Quarter 10 4 p.m.
25 ,, ○ Full Moon 11 16 a.m.

1st Sept. Apogee, 10·54 a.m.
13th ,, Perigee 8·24 a.m.
29th ,, Apogee, 3·24 a.m.

During July the planet Mercury will pass eastwards, apparently from the constellation Taurus, through Gemini and Cancer into Leo. Venus will also apparently pass from Taurus through Gemini into Cancer, Mars from Gemini into Cancer. Jupiter will seem to move only about one degree eastward in Libra, while Saturn will apparently move about a degree and a half further east amongst the stars of Virgo.

From 1st August to 30th September Mercury and Venus will apparently move on through Leo into Virgo, and Mars from the eastern part of Cancer to that of Leo. Jupiter will apparently move only about eight degrees further east in Libra, and Saturn about five and a half degrees in Virgo.

A partial eclipse of the moon, visible in Queensland, will take place about 9 o'clock in the evening of 26th August.

A total eclipse of the sun will take place a fortnight later, visible only in the North Pacific, Central America and Gulf of Mexico.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]